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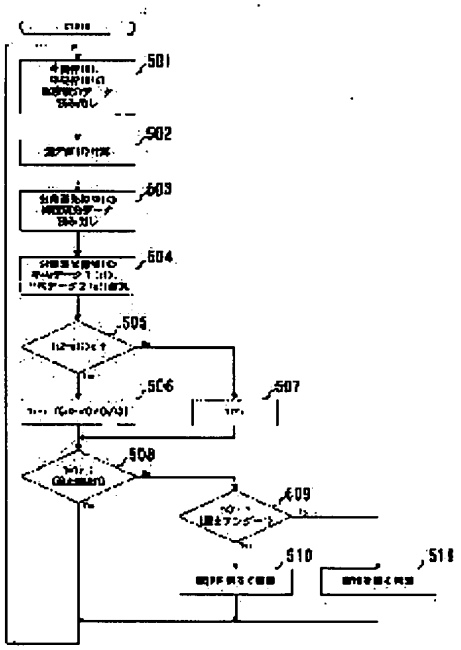
(54) IMAGE PICKUP DEVICE AND METHOD, AND COMPUTER-READABLE RECORDING MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an image pickup device, an image pickup method and a recording medium that can suitably conduct proper exposure control even when objects extremely different in luminance and contrast are in existence within the same view angle.

SOLUTION: The image pickup method comprises a step where a mean value a1 of photometric luminance integration data for all of m×n of split photometric frames is calculated, a step where a mean value a2 of x-sets of the photometric luminance integration data sampled in the higher order of luminance is calculated in the m×n of split photometric frames, and a step where the proper object for exposure control is decreasingly corrected in response to a value (a2-a1) when the difference between the mean values a1 and a2 exceeds a prescribed threshold (z).



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CLAIMS

[Claim(s)]
[Claim 1] A means to compute the average a1 of the photometry brightness integral data in all the frames of P division photometry frames by being image pick-up equipment with P division photometry frames (P being three or more integers), A means to compute the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among P division photometry frames, Image pick-up equipment characterized by having the means which amends proper desired value Yr of exposure control using said average a1 and said average a2.
[Claim 2] Image pick-up equipment according to claim 1 characterized by amending in the direction which lowers the proper desired value Yr of exposure control according to the value of (a2-a1) when the difference of said average a1 and said average a2 exceeds the predetermined threshold z.
[Claim 3] The amendment which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1) is the following formulas. Yr = r - {(a2-a1) x (b/c)} .... (1)
It is image pick-up equipment according to claim 2 characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 4] A means to compute the average a1 of the photometry brightness integral data in all the frames of P division photometry frames by being image pick-up equipment with P division photometry frames (P being three or more integers), A means to compute the average a3 of y photometry brightness integral data (however, 1<y<P) sampled from order with brightness low among P division photometry frames, Image pick-up equipment characterized by having the means which amends proper desired value Yr of exposure control using said average a1 and said average a3.
[Claim 5] Image pick-up equipment according to claim 4 characterized by amending in the direction which raises the proper desired value Yr of exposure control according to the value of (a1-a3) when the difference of said average a1 and said average a3 exceeds the predetermined threshold z.
[Claim 6] The amendment which raises the proper desired value Yr of exposure control according to the value of the above (a1-a3) is the following formulas. Yr = r + {(a1-a3) x (b/c)} .... (3)
It is image pick-up equipment according to claim 5 characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 7] A means to compute the average a1 of the photometry brightness integral data in all the frames of P division photometry frames by being image pick-up equipment with P division photometry frames (P being three or more integers), A means to compute the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among P division photometry frames, A means to compute the average a3 of y photometry brightness integral data (however, 1<y<P) sampled from order with brightness low among P division photometry frames, Said average a1, said average a2, image pick-up equipment characterized by having the means which uses said average a3 for a list, and amends proper desired value Yr of exposure control.
[Claim 8] either the difference of said average a1 and said average a2, or the difference of said average a1 and said average a3 -- the image pick-up equipment according to claim 7 characterized by amending the proper desired value Yr of exposure control in the vertical direction according to a value when the larger one exceeds the predetermined threshold z (a2-a1) (a1-a3).
[Claim 9] The formula of the following [amendment / which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1) when the value of the above (a2-a1) exceeds the predetermined threshold z more greatly / the value of the above (a2-a1) / than the value of the above (a1-a3)], Yr = r - {(a2-a1) x (b/c)} .... (2)

It is image pick-up equipment according to claim 8 characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 10] The formula of the following [amendment / which raises the proper desired value Yr of exposure control according to the value of the above (a1-a3) when the value of the above (a1-a3) exceeds the predetermined threshold z smaller / the value of the above (a2-a1) / than the value of the above (a1-a3)], Yr = r + {(a1-a3) x (b/c)} .... (3)
It is image pick-up equipment according to claim 8 characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 11] The procedure which computes the average a1 of the photometry brightness integral data in all the frames of P division photometry frames by being the image pick-up approach with P division photometry frames (P being three or more integers), The procedure which computes the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among P division photometry frames, The image pick-up approach characterized by including the procedure which amends proper desired value Yr of exposure control using said average a1 and said average a2.
[Claim 12] The image pick-up approach according to claim 11 characterized by amending in the direction which lowers the proper desired value Yr of exposure control according to the value of (a2-a1) when the difference of said average a1 and said average a2 exceeds the predetermined threshold z.
[Claim 13] The amendment which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1) is the following formulas. Yr = r - {(a2-a1) x (b/c)} .... (1)
It is the image pick-up approach according to claim 12 characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 14] The procedure which computes the average a1 of the photometry brightness integral data in all the frames of P division photometry frames by being the image pick-up approach with P division photometry frames (P being three or more integers), The procedure which computes the average a3 of y photometry brightness integral data (however, 1<y<P) sampled from order with brightness low among P division photometry frames, The image pick-up approach characterized by including the procedure which amends proper desired value Yr of exposure control using said average a1 and said average a3.
[Claim 15] The image pick-up approach according to claim 14 characterized by amending in the direction which raises the proper desired value Yr of exposure control according to the value of (a1-a3) when the difference of said average a1 and said average a3 exceeds the predetermined threshold z.
[Claim 16] The amendment which raises the proper desired value Yr of exposure control according to the value of the above (a1-a3) is the following formulas. Yr = r + {(a1-a3) x (b/c)} .... (3)
It is the image pick-up approach according to claim 15 characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 17] The procedure which computes the average a1 of the photometry brightness integral data in all the frames of P division photometry frames by being the image pick-up approach with P division photometry frames (P being three or more integers), The procedure which computes the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among P division photometry frames, The procedure which computes the average a3 of y photometry brightness integral data (however, 1<y<P) sampled from order with brightness low among P division photometry frames, Said average a1, said average a2, the image pick-up approach characterized by including the procedure which uses said average a3 for a list, and amends proper desired value Yr of exposure control.

[Claim 18] either the difference of said average a1 and said average a2, or the difference of said average a1 and said average a3 -- the image pick-up approach according to claim 17 characterized by amending the proper desired value Yr of exposure control in the vertical direction according to a value when the larger one exceeds the predetermined threshold z (a2-a1) (a1-a3).
[Claim 19] The formula of the following [amendment / which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1) when the value of the above (a2-a1) exceeds the predetermined threshold z more greatly / the value of the above (a2-a1) / than the value of the above (a1-a3)], Yr = r - {(a2-a1) x (b/c)} .... (2)
It is the image pick-up approach according to claim 18 characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 20] The formula of the following [amendment / which raises the proper desired value Yr of exposure control according to the value of the above (a1-a3) when the value of the above (a1-a3) exceeds the predetermined threshold z smaller / the value of the above (a2-a1) / than the value of the

above (a1-a3)], Yr = r + {(a1-a3) x (b/c)} .... (3)
It is the image pick-up approach according to claim 18 characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 21] The record medium which memorized the program for operating a computer as each means included in said claim 1 thru/or image pick-up equipment given in any 1 of 10 and in which computer reading is possible.
[Claim 22] The record medium which memorized the program for performing each procedure included in the image pick-up approach of given in a computer said claim 11 thru/or any 1 of 20 and in which computer reading is possible.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] Even if this invention has the photographic subject with which image pick-up equipment and an approach are started, especially brightness contrast differs extremely in the same field angle, it relates to the record medium in which computer reading is possible at the image pick-up equipment and the image pick-up approach of realizing suitable fitness exposure control, and a list.
[0002]
[Description of the Prior Art] Conventionally, as a type of optical measurement for exposure control, as shown in drawing 7 , it asks by integrating with the average luminance-signal level of the whole (inside of the whole frame 201) screen. It asks by integrating with the average luminance-signal level of a central part (inside of the central frame 202) similarly, these are combined, and the "central important photometry" which measures the strength of the light is widely used by generating an exposure evaluation signal with emphasis on the photographic subject (inside of the central frame 202) of middle of the screen.
[0003] However, the "central important photometry" widely used in the above-mentioned former was premised on the main photographic subject existing in middle of the screen, and when it existed in the location from which the main photographic subject separated from a part for a screen center section (for example, inside of the central frame 202), there was a problem that a photometry (exposure control) will be made to photographic subjects other than the main photographic subject.
[0004] For example, it will become the image to which the face of the person who control is made in the direction in which a diaphragm is opened since exposure control will be performed so that the part of the black dress which exists in the center when the part of the dress of the person who wore the black dress which is the main photographic subject for a dark background as shown in drawing 8 exists in middle of the screen and a face exists in the central upper part may serve as correct exposure, and is the main photographic subject has white-flown. In addition, drawing 7 and drawing 8 are drawings for explaining the exposure control action in conventional image pick-up equipment.
[0005] Moreover, since it will also set when the photographic subject with which brightness contrast differs extremely is in the same screen, and exposure control with emphasis on the photographic subject of middle of the screen will be performed fixed, the problem that an extreme white kite and black crushing will occur was in the photographic subject made into the purpose.
[0006]
[Problem(s) to be Solved by the Invention] As stated above, since exposure control was made to the photographic subject which exists in middle of the screen, when the photographic subject with which brightness contrast differs extremely was in the same screen, with conventional image pick-up equipment, the problem that an extreme white kite and black crushing will occur was in the photographic subject made into the purpose.
[0007] This invention is made in view of the above-mentioned problem, and even if the photographic subject with which brightness contrast differs extremely is in the same field angle, it aims at providing the image pick-up equipment which can enable suitable fitness exposure control, the image pick-up approach, and a list with the record medium in which computer reading is possible.
[0008]
[Means for Solving the Problem] In order to attain the above-mentioned purpose, the image pick-up equipment according to claim 1 which is this invention A means to compute the average a1 of the

photometry brightness integral data in all the frames of P division photometry frames by being image pick-up equipment with P division photometry frames (P being three or more integers), It is characterized by having a means to compute the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among P division photometry frames, and the means which amends proper desired value Yr of exposure control using said average a1 and said average a2.

[0009] Moreover, the image pick-up equipment according to claim 2 which is this invention is characterized by amending in the direction which lowers the proper desired value Yr of exposure control according to the value of (a2-a1), when the difference of said average a1 and said average a2 exceeds the predetermined threshold z.

[0010] Moreover, the image pick-up equipment according to claim 3 which is this invention is the formula of the following [amendment / which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1)]. $Yr = r - \{(a2-a1) \times (b/c)\}$ .... (1)
It is characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).

[0011] Moreover, the image pick-up equipment according to claim 4 which is this invention A means to compute the average a1 of the photometry brightness integral data in all the frames of P division photometry frames by being image pick-up equipment with P division photometry frames (P being three or more integers), It is characterized by having a means to compute the average a3 of y photometry brightness integral data (however, 1<y<P) sampled from order with brightness low among P division photometry frames, and the means which amends proper desired value Yr of exposure control using said average a1 and said average a3.

[0012] Moreover, the image pick-up equipment according to claim 5 which is this invention is characterized by amending in the direction which raises the proper desired value Yr of exposure control according to the value of (a1-a3), when the difference of said average a1 and said average a3 exceeds the predetermined threshold z.

[0013] Moreover, the image pick-up equipment according to claim 6 which is this invention is the formula of the following [amendment / which raises the proper desired value Yr of exposure control according to the value of the above (a1-a3)]. $Yr = r + \{(a1-a3) \times (b/c)\}$ .... (3)
It is characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).

[0014] Moreover, the image pick-up equipment according to claim 7 which is this invention A means to compute the average a1 of the photometry brightness integral data in all the frames of P division photometry frames by being image pick-up equipment with P division photometry frames (P being three or more integers), A means to compute the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among P division photometry frames, A means to compute the average a3 of y photometry brightness integral data (however, 1<y<P) sampled from order with brightness low among P division photometry frames, It is characterized by having the means which uses said average a3 for said average a1, said average a2, and a list, and amends proper desired value Yr of exposure control.

[0015] moreover, the image pick-up equipment according to claim 8 which is this invention -- either the difference of said average a1 and said average a2, or the difference of said average a1 and said average a3 -- when the larger one exceeds the predetermined threshold z (a2-a1) (a1-a3), according to a value, it is characterized by amending the proper desired value Yr of exposure control in the vertical direction.

[0016] Moreover, the formula of the following [amendment / which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1) when the value of the above (a2-a1) exceeds the predetermined threshold z more greatly / the value of the above (a2-a1) / than the value of the above (a1-a3) as for the image pick-up equipment according to claim 9 which is this invention], $Yr = r - \{(a2-a1) \times (b/c)\}$ .... (2)
It is characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).

[0017] Moreover, the image pick-up equipment according to claim 10 which is this invention The formula of the following [amendment / which raises the proper desired value Yr of exposure control according to the value of the above (a1-a3) when the value of the above (a1-a3) exceeds the predetermined threshold z smaller / the value of the above (a2-a1) / than the value of the above (a1-a3)], $Yr = r + \{(a1-a3) \times (b/c)\}$ .... (3)

It is characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).

[0018] Moreover, the image pick-up approach according to claim 11 which is this invention The procedure which computes the average a1 of the photometry brightness integral data in all the frames of P division photometry frames by being the image pick-up approach with P division photometry frames (P being three or more integers), It is characterized by including the procedure which computes the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among P division photometry frames, and the procedure which amends proper desired value Yr of exposure control using said average a1 and said average a2.

[0019] Moreover, the image pick-up approach according to claim 12 which is this invention is characterized by amending in the direction which lowers the proper desired value Yr of exposure control according to the value of (a2-a1), when the difference of said average a1 and said average a2 exceeds the predetermined threshold z.

[0020] Moreover, the image pick-up approach according to claim 13 which is this invention is the formula of the following [amendment / which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1)]. $Yr = r - \{(a2-a1) \times (b/c)\}$ .... (1)
It is characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).

[0021] Moreover, the image pick-up approach according to claim 14 which is this invention The procedure which computes the average a1 of the photometry brightness integral data in all the frames of P division photometry frames by being the image pick-up approach with P division photometry frames (P being three or more integers), It is characterized by including the procedure which computes the average a3 of y photometry brightness integral data (however, 1<y<P) sampled from order with brightness low among P division photometry frames, and the procedure which amends proper desired value Yr of exposure control using said average a1 and said average a3.

[0022] Moreover, the image pick-up approach according to claim 15 which is this invention is characterized by amending in the direction which raises the proper desired value Yr of exposure control according to the value of (a1-a3), when the difference of said average a1 and said average a3 exceeds the predetermined threshold z.

[0023] Moreover, the image pick-up approach according to claim 16 which is this invention is the formula of the following [amendment / which raises the proper desired value Yr of exposure control according to the value of the above (a1-a3)]. $Yr = r + \{(a1-a3) \times (b/c)\}$ .... (3)
It is characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).

[0024] Moreover, the image pick-up approach according to claim 17 which is this invention The procedure which computes the average a1 of the photometry brightness integral data in all the frames of P division photometry frames by being the image pick-up approach with P division photometry frames (P being three or more integers), The procedure which computes the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among P division photometry frames, The procedure which computes the average a3 of y photometry brightness integral data (however, 1<y<P) sampled from order with brightness low among P division photometry frames, It is characterized by including the procedure which uses said average a3 for said average a1, said average a2, and a list, and amends proper desired value Yr of exposure control.

[0025] moreover, the image pick-up approach according to claim 18 which is this invention -- either the difference of said average a1 and said average a2, or the difference of said average a1 and said average a3 -- when the larger one exceeds the predetermined threshold z (a2-a1) (a1-a3), according to a value, it is characterized by amending the proper desired value Yr of exposure control in the vertical direction.

[0026] Moreover, the image pick-up approach according to claim 19 which is this invention The formula of the following [amendment / which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1) when the value of the above (a2-a1) exceeds the predetermined threshold z more greatly / the value of the above (a2-a1) / than the value of the above (a1-a3)], $Yr = r - \{(a2-a1) \times (b/c)\}$ .... (2)
It is characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).

[0027] Moreover, the image pick-up approach according to claim 20 which is this invention The formula of the following [amendment / which raises the proper desired value Yr of exposure control according

to the value of the above (a1-a3) when the value of the above (a1-a3) exceeds the predetermined threshold z smaller / the value of the above (a2-a1) / than the value of the above (a1-a3)], Yr = r + {(a1-a3) x (b/c)} .... (3)
It is characterized by being carried out based on (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[0028] Moreover, the record medium which is this invention and in which computer reading according to claim 21 is possible is characterized by memorizing the program for operating a computer as each means included in said claim 1 thru/or image pick-up equipment given in any 1 of 10.
[0029] Moreover, the record medium which is this invention and in which computer reading according to claim 22 is possible is characterized by memorizing the program for performing each procedure included in the image pick-up approach of given in a computer said claim 11 thru/or any 1 of 20.
[0030] According to the above-mentioned invention, since the proper desired value of exposure control was amended according to the inclination of the luminance distribution in the division photometry frame in a screen, even if the photographic subject with which brightness contrast differs extremely is in the same screen, putting emphasis on a part for a screen center section, the extreme white kite and black crushing of a photographic subject can be prevented, and it becomes possible to photo a suitable photographic subject image.
[0031]
[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail with reference to a drawing.
[0032] Drawing 1 is the block diagram having shown the configuration of the image pick-up equipment in this invention. drawing 1 -- being shown -- as -- this invention -- it can set -- an image pick-up -- equipment -- a lens -- a unit -- 101 -- a lens -- 102 -- a diaphragm -- 103 -- an image sensor -- 104 -- CDS (correlation duplex sampling) -- 105 -- AGC (automatic gain control) -- 106 -- a camera -- signal processing -- the section -- 107 -- a gate circuit -- 108 -- an integrating circuit -- 109 -- A/D conversion -- a circuit -- 110 -- a timing generator -- (-- TG --) -- 111 -- a diaphragm -- a control circuit -- 112 -- a camera -- a control section -- 113 -- constituting -- having .
[0033] From a lens 102, the photographic subject light which carried out incidence passes along diaphragm 103, and it carries out image formation on the image sensors 104, such as CCD. Photo electric conversion of the photographic subject light which carried out image formation is carried out by the image sensor 104, and it is outputted to the exterior of the lens unit 101 as a video signal. The video signal by which photo electric conversion was carried out passes along CDS105 and AGC106, and is supplied to the gate circuit 108 for setting up the camera signal-processing section 107 and photometry area.
[0034] Detection separation of the luminance signal in applicable photometry area is carried out, the video signal supplied to the gate circuit 108 is supplied to an integrating circuit 109, and integral processing is carried out. The A/D-conversion circuit 110 is changed into the luminance signal with which it integrated by the through digital signal, and it is supplied to the camera control section 113 as an exposure evaluation signal.
[0035] brightness -- an integral -- data -- supplying -- having had -- a camera -- a control section -- 113 -- it -- a basis -- exposure -- judging -- exposure -- being proper -- ** -- becoming -- as -- an image sensor (CCD) -- 104 -- shutter speed -- controlling -- a timing generator -- (-- TG --) -- 111 -- a diaphragm -- a control circuit -- 112 -- AGC -- 106 -- controlling .
[0036] (Gestalt of the 1st operation) With reference to drawing 2 , the gestalt of operation of the 1st of this invention is explained hereafter. Drawing 2 is the flow chart which showed the exposure control action of the camera control section 113 in the gestalt of operation of the 1st of the image pick-up equipment of this invention.
[0037] The full screen picturized with an image sensor 104 is divided into the mesh size (mxn) which consists of a 8x8=64 piece division photometry frame, and the gestalt of this operation explains as that whose x samplings of the division photometry frame used for a photometry are 16 pieces, as shown in drawing 3 . In addition, drawing 3 is drawing for explaining the exposure control action in the image pick-up equipment of this invention. moreover, m and n -- respectively -- two or more integers -- it is -- x samplings -- 1 -- being large (mxn) -- it is a small integer.
[0038] First, the camera control section 113 acquires the brightness integral data of the whole surface frame 201 in drawing 7 with which the integrating circuit 109 was integrated, and the central frame 202, respectively (step 501), and computes the screen photometry value Y from the brightness integral data of

the this acquired whole surface frame 201, and the brightness integral data of the central frame 202 (step 502). In addition, the calculation approach of the screen photometry value Y is the same (common knowledge) with the former, and since it changes with properties (configuration) of image pick-up equipment etc., explanation here is omitted.

[0039] Next, the camera control section 113 acquires the brightness integral data in all the frames (64 pieces) of the division photometry frame 301 in drawing 3 with which the integrating circuit 109 was integrated (step 503). The average a1 of the brightness integral data of all 64 frames and the average a2 of the brightness integral data of 16 frames which sampled x samplings from order with high brightness are computed from the brightness integral data of all the frames (64 pieces) of the acquired this division photometry frame 301 (step 504).

[0040] Next, it sets step 505 and it is judged whether the calculated value of (a2-a1) is larger than a threshold z or small. When it is judged at step 505 that the calculated value of (a2-a1) is smaller than a threshold z, let exposure proper desired value Yr be the default r set up based on the threshold z (step 507). In addition, a threshold z is a value (forward real number) determined based on the property of image pick-up equipment (configuration), for example, the path of a lens, the number of pixels of an image sensor, etc.

[0041] When it is judged at step 505 that the calculated value of (a2-a1) is larger than a threshold z, the new exposure fitness desired value Yr is set up by the formula (1) shown below (step 506).

$$Yr = r - \{(a2-a1) \times (b/c)\} \quad \ldots\ (1)$$

Here, b and c are correction factors and adjust effectiveness of amendment with this value.

[0042] Change of the proper desired value according to the value by this control (step 505,506,507) (a2-a1) is shown in drawing 4 . Drawing 4 is the graph which showed change of the proper desired value according to the value in the gestalt of the 1st operation (a2-a1). That is, as mentioned above, when the calculated value of (a2-a1) is smaller than a threshold z, proper desired value turns into constant value (default r), and when the calculated value of (a2-a1) is larger than a threshold z, proper desired value carries out monotone reduction according to a formula (1).

[0043] As usual, based on an exposure, diaphragm 103, shutter speed, and AGC106 grade are controlled by the above processing, and after setting up the proper desired value Yr, by it, exposure control is performed so that exposure (screen photometry value Y) may become the same as the proper desired value Yr (step 508,509,510,511).

[0044] (Gestalt of the 2nd operation) Next, with reference to drawing 5 , the gestalt of operation of the 2nd of this invention is explained. Drawing 5 is the flow chart which showed the exposure control action of the camera control section 113 in the gestalt of operation of the 2nd of the image pick-up equipment of this invention.

[0045] Also in the gestalt of this operation, like the gestalt of the 1st operation, as shown in drawing 3 , the full screen picturized with an image sensor 104 is divided into the mesh size (mxn) which consists of a 8x8=64 piece division photometry frame, and it explains as that whose x samplings of the division photometry frame used for a photometry are 16 pieces. in addition, m and n -- respectively -- two or more integers -- it is -- x samplings -- 1 -- being large (mxn) -- it is a small integer.

[0046] First, the camera control section 113 acquires the brightness integral data of the whole surface frame 201 in drawing 7 with which the integrating circuit 109 was integrated, and the central frame 202, respectively (step 601), and computes the screen photometry value Y from the brightness integral data of the this acquired whole surface frame 201, and the brightness integral data of the central frame 202 (step 602). In addition, the calculation approach of the screen photometry value Y is the same (common knowledge) with the former, and since it changes with properties (configuration) of image pick-up equipment etc., explanation here is omitted.

[0047] Next, the camera control section 113 acquires the brightness integral data in all the frames (64 pieces) of the division photometry frame 301 in drawing 3 with which the integrating circuit 109 was integrated (step 603). From the brightness integral data of all the frames (64 pieces) of the acquired this division photometry frame 301, the average a1 of the brightness integral data of all 64 frames, The average value a2 of the brightness integral data of 16 frames which sampled x samplings from order with high brightness, and the average value a3 of the brightness integral data of 16 frames sampled from order with low brightness are computed (step 604).

[0048] Next, in step 605, it is judged which is larger between the calculated value of (a2-a1) and the calculated value of (a1-a3). At step 605, when the calculated value of (a2-a1) is larger than the calculated value of (a1-a3), it is judged by step 606 whether the calculated value of (a2-a1) is larger than

a threshold z or small. When it is judged at step 606 that the calculated value of (a2-a1) is smaller than a threshold z, let exposure proper desired value Yr be the default r set up based on the threshold z (step 507). In addition, a threshold z is a value (forward real number) determined based on the property of image pick-up equipment (configuration), for example, the path of a lens, the number of pixels of an image sensor, etc.

[0049] When it is judged at step 606 that the calculated value of (a2-a1) is larger than a threshold z, the new exposure fitness desired value Yr is set up by the formula (2) shown below (step 607).

$Yr = r - \{(a2-a1) \times (b/c)\}$ .... (2)

Here, b and c are correction factors and adjust effectiveness of amendment with this value.

[0050] On the other hand, at step 605, when the calculated value of (a2-a1) is smaller than the calculated value of (a1-a3), it is judged by step 609 whether the calculated value of (a1-a3) is larger than a threshold z or small. When it is judged at step 609 that the calculated value of (a1-a3) is smaller than a threshold z, let exposure proper desired value Yr be the default r set up based on the threshold z (step 608).

[0051] When it is judged at step 609 that the calculated value of (a1-a3) is larger than a threshold z, the new exposure fitness desired value Yr is set up by the formula (3) shown below (step 610).

$Yr = r + \{(a1-a3) \times (b/c)\}$ .... (3)

Here, b and c are correction factors and adjust effectiveness of amendment with this value.

[0052] Change of the proper desired value according to the value by this control (steps 605, 606, and 607,608,609,610) (a2-a1) is shown in drawing 6 . Drawing 6 is the graph which showed change of the proper desired value according to the value in the gestalt of the 2nd operation (a2-a1).

[0053] That is, as mentioned above, when calculated value is smaller than a threshold z, smaller [the calculated value of (a2-a1) / and (a2-a1)] than the calculated value of (a1-a3), proper desired value turns into constant value (default r), and when the calculated value of (a2-a1) is larger than a threshold z, proper desired value carries out monotone reduction according to a formula (2).

[0054] Moreover, more greatly [the calculated value of (a2-a1) / and (a1-a3)] than the calculated value of (a1-a3), when calculated value is smaller than a threshold z, proper desired value turns into constant value (default r), and when the calculated value of (a1-a3) is larger than a threshold z, proper desired value carries out the increment in monotone according to a formula (3).

[0055] As usual, based on an exposure, diaphragm 103, shutter speed, and AGC106 grade are controlled by the above processing, and after setting up the proper desired value Yr, by it, exposure control is performed so that exposure (screen photometry value Y) may become the same as the proper desired value Yr (step 611,612,613,614).

[0056] According to the above-mentioned invention, since the extreme white kite and black crushing of a photographic subject can be prevented according to the inclination of the contrast distribution in the whole screen, even if the photographic subject with which brightness contrast differs extremely is in the same screen, putting emphasis on a part for a screen center section, it becomes possible to photo a suitable photographic subject image.

[0057] Moreover, according to the above-mentioned invention, the image pick-up equipment which has a division photometry frame in the shape of a mesh (mxn) was explained, but you may have a division photometry frame in the shape of one line (1xn:n is three or more integers).

[0058] In addition, even if it applies above-mentioned this invention to the system which consists of two or more devices, it may be applied to the equipment which consists of one device. Moreover, so that various kinds of devices may be operated in order to realize the function of the operation gestalt mentioned above As opposed to the computer in the equipment connected with these various devices, or a system The program code of the software for realizing the function of the above-mentioned operation gestalt is supplied. What was carried out by operating the various above-mentioned devices according to the program stored in the computer (CPU or MPU) of the system or equipment is contained under the category of this invention.

[0059] Moreover, the function of the operation gestalt which the program code of the above-mentioned software itself mentioned above in this case will be realized, and the record medium which stored the means for supplying that program code itself and its program code to a computer, for example, this program code, constitutes this invention. As a record medium which memorizes this program code, a floppy disk, a hard disk, an optical disk, a magneto-optic disk, CD-ROM, a magnetic tape, the memory card of a non-volatile, ROM, etc. can be used, for example.

[0060] Moreover, by performing the program code with which the computer was supplied, also when the

function of an above-mentioned operation gestalt is not only realized, but the function of an above-mentioned operation gestalt is realized in collaboration with OS (operating system) or other application software etc. with which the program code is working in a computer, it cannot be overemphasized that this program code is contained in the operation gestalt of this invention.

[0061] Furthermore, after stored in the memory with which the functional expansion unit by which the supplied program code was connected to the functional add-in board and the computer of a computer is equipped, also when the function of the operation gestalt which the CPU with which the functional add-in board and functional expansion unit are equipped based on directions of the program code performed a part or all of actual processing, and mentioned above by the processing is realized, it cannot be overemphasized that it is contained in this invention.

[0062] In addition, it passes over no the configurations and structures of each part which were shown in the above-mentioned operation gestalt to what showed a mere example of the somatization which hits carrying out this invention, and the technical range of this invention must not be restrictively interpreted by these. That is, this invention can be carried out in various forms, without deviating from the pneuma or its main description.

[0063]

[Effect of the Invention] Putting emphasis on a part for a screen center section according to this invention, as explained above, the extreme white kite and black crushing of a photographic subject can be prevented by amending the proper desired value of exposure control according to the inclination of the luminance distribution in the division photometry frame in a screen, and even if the photographic subject with which brightness contrast differs extremely is in the same screen, a suitable photographic subject image can be photoed.

[Translation done.]

* NOTICES *

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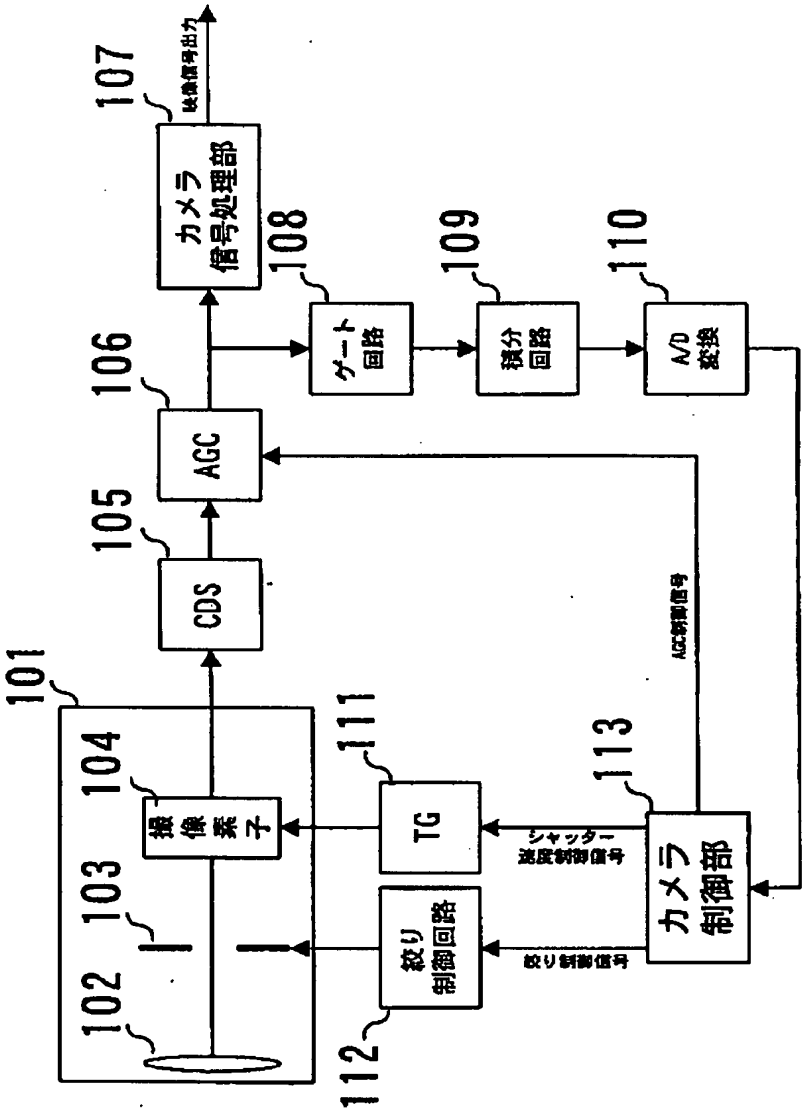
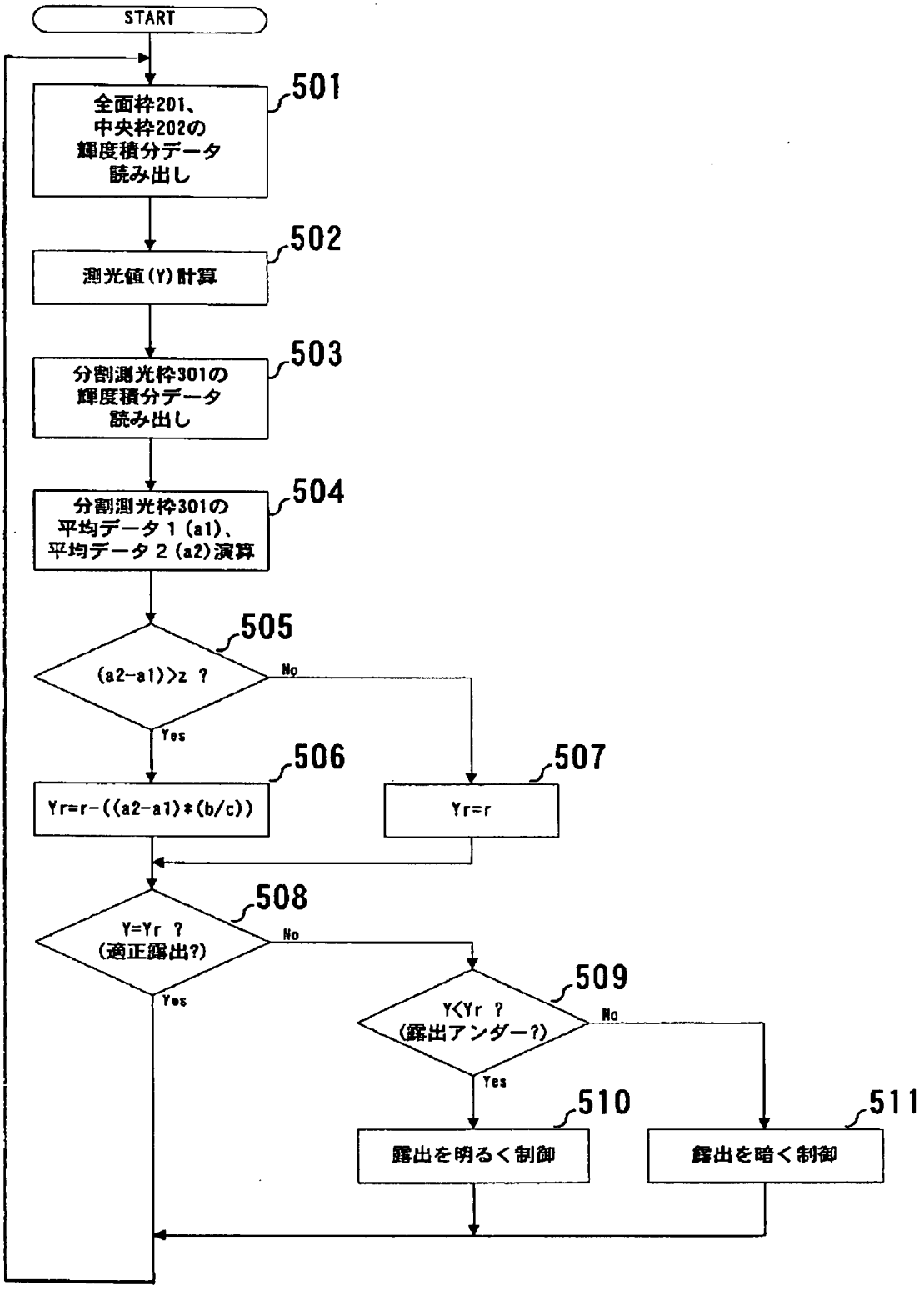
DRAWINGS

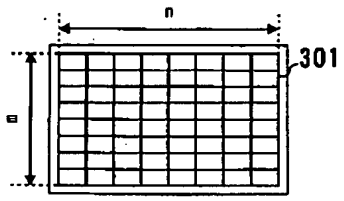
[Drawing 1]



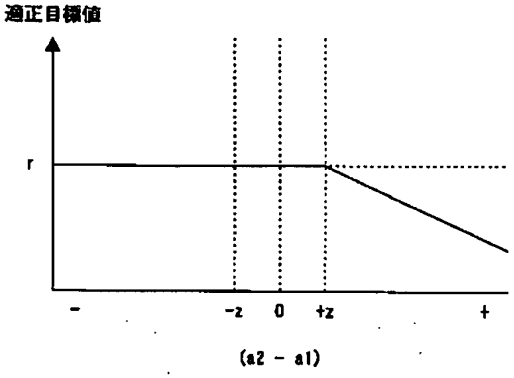
[Drawing 2]


START
全面枠201、
中央枠202の
輝度積分データ
読み出し
501
測光値(Y)計算
502
分割測光枠301の
輝度積分データ
読み出し
503
分割測光枠301の
平均データ1(a1)、
平均データ2(a2)演算
504
(a2-a1)>z ?
505
No
Yes
Yr=r-((a2-a1)*(b/c))
506
Yr=r
507
Y=Yr ?
(適正露出?)
508
No
Yes
Y<Yr ?
(露出アンダー?)
509
No
Yes
露出を明るく制御
510
露出を暗く制御
511

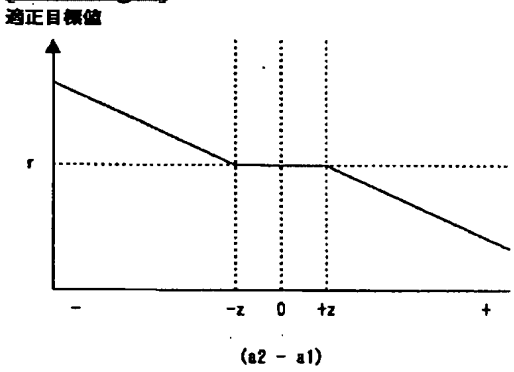
[Drawing 3]



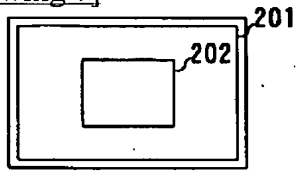
[Drawing 4]



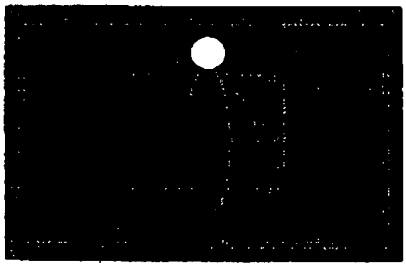
[Drawing 6]



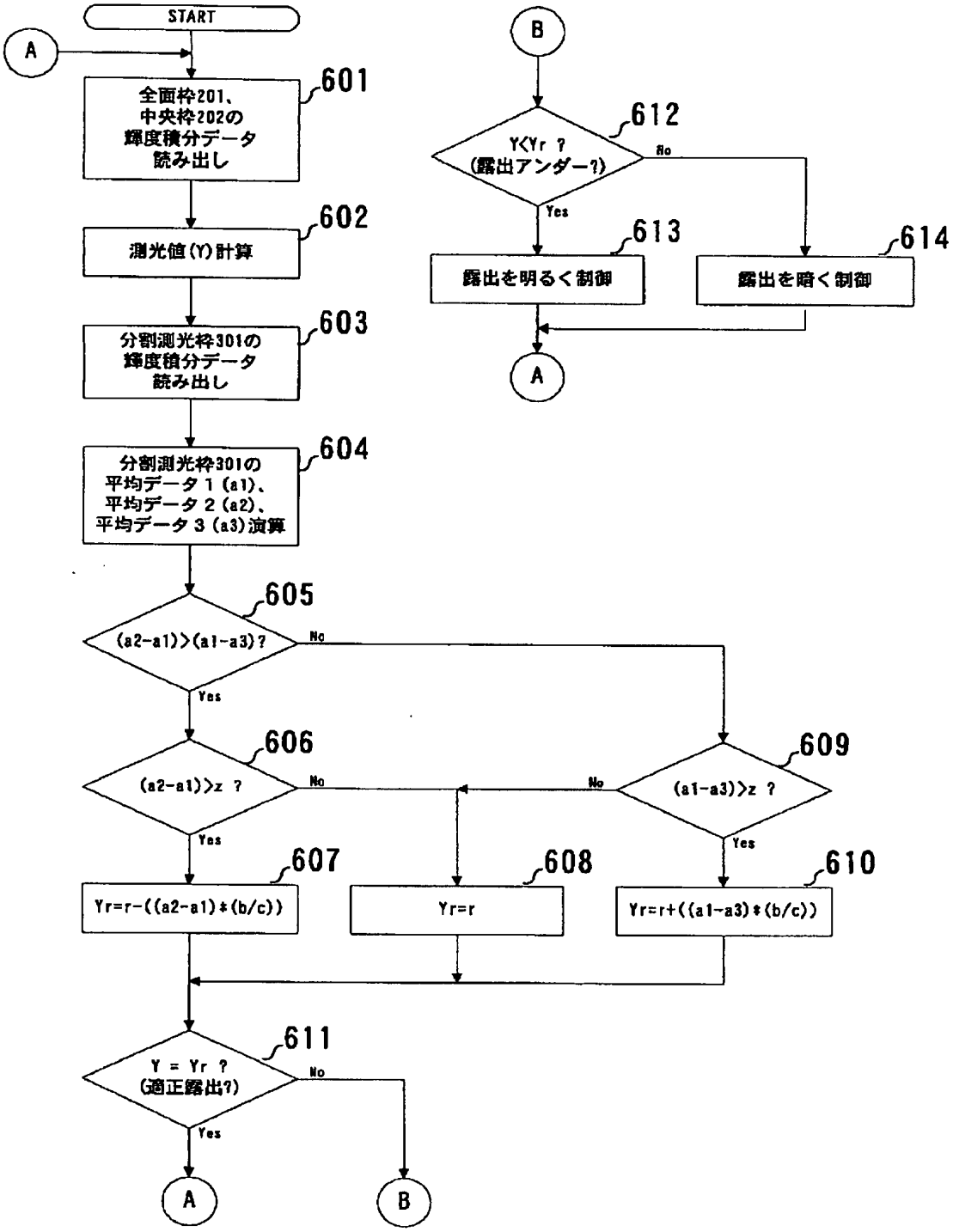
[Drawing 7]



[Drawing 8]



[Drawing 5]



[Translation done.]

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CORRECTION OR AMENDMENT

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[Filing Date] March 2, Heisei 13 (2001. 3.2)
[Procedure amendment 1]
[Document to be Amended] Specification
[Item(s) to be Amended] Claim
[Method of Amendment] Modification
[Proposed Amendment]
[Claim(s)]
[Claim 1] Image pick-up equipment characterized by providing the following. Two or more division photometry frames A means to compute the average a1 of the photometry brightness integral data of division photometry P of said two or more division photometry frames (P is three or more integers) A means to compute the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among said two or more division photometry frames The means which amends proper desired value Yr of exposure control using said average a1 and said average a2
[Claim 2] Image pick-up equipment according to claim 1 characterized by amending in the direction which lowers the proper desired value Yr of exposure control according to the value of (a2-a1) when the difference of said average a1 and said average a2 exceeds the predetermined threshold z.
[Claim 3] The amendment which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1) is the following formulas and Yr. = r - {(a2-a1) x (b/c)} .... It is image pick-up equipment according to claim 2 characterized by being carried out based on (1) and (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 4] Image pick-up equipment characterized by providing the following. Two or more division photometry frames A means to compute the average a1 of the photometry brightness integral data of division photometry P of said two or more division photometry frames (P is three or more integers) A means to compute the average a3 of y photometry brightness integral data (however, 1<x<P) sampled from order with brightness low among said two or more division photometry frames The means which amends proper desired value Yr of exposure control using said average a1 and said average a3
[Claim 5] Image pick-up equipment according to claim 4 characterized by amending in the direction

which raises the proper desired value Yr of exposure control according to the value of (a1-a3) when the difference of said average a1 and said average a3 exceeds the predetermined threshold z.
[Claim 6] The amendment which raises the proper desired value Yr of exposure control according to the value of the above (a1-a3) is the following formulas and Yr. = r + {(a1-a3) x (b/c)} .... It is image pick-up equipment according to claim 5 characterized by being carried out based on (3) and (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 7] Image pick-up equipment characterized by providing the following. Two or more division photometry frames A means to compute the average a1 of the photometry brightness integral data of division photometry P of said two or more division photometry frames (P is three or more integers) A means to compute the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among said two or more division photometry frames A means to compute the average a3 of y photometry brightness integral data (however, 1<x<P) sampled from order with brightness low among said two or more division photometry frames, and the means which uses said average a3 for said average a1, said average a2, and a list, and amends proper desired value Yr of exposure control
[Claim 8] either the difference of said average a1 and said average a2, or the difference of said average a1 and said average a3 -- the image pick-up equipment according to claim 7 characterized by amending the proper desired value Yr of exposure control in the vertical direction according to a value when the larger one exceeds the predetermined threshold z (a2-a1) (a1-a3).
[Claim 9] When the value of the above (a2-a1) exceeds the predetermined threshold z more greatly [the value of the above (a2-a1)] than the value of the above (a1-a3), The formula of the following [amendment / which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1)], Yr = r - {(a2-a1) x (b/c)} .... It is image pick-up equipment according to claim 8 characterized by being carried out based on (2) and (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 10] When the value of the above (a1-a3) exceeds the predetermined threshold z smaller [the value of the above (a2-a1)] than the value of the above (a1-a3), The formula of the following [amendment / which raises the proper desired value Yr of exposure control according to the value of the above (a1-a3)], Yr = r + {(a1-a3) x (b/c)} .... It is image pick-up equipment according to claim 8 characterized by being carried out based on (3) and (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 11] The image pick-up approach of image pick-up equipment with two or more division photometry frames characterized by providing the following The procedure which computes the average a1 of the photometry brightness integral data of division photometry P of said two or more division photometry frames (P is three or more integers) The procedure which computes the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among said two or more division photometry frames The procedure which amends proper desired value Yr of exposure control using said average a1 and said average a2
[Claim 12] The image pick-up approach according to claim 11 characterized by amending in the direction which lowers the proper desired value Yr of exposure control according to the value of (a2-a1) when the difference of said average a1 and said average a2 exceeds the predetermined threshold z.
[Claim 13] The amendment which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1) is the following formulas and Yr. = r - {(a2-a1) x (b/c)} .... It is the image pick-up approach according to claim 12 characterized by being carried out based on (1) and (the default set up by basing b and c on a correction factor, and basing r on a threshold z).
[Claim 14] The image pick-up approach of image pick-up equipment with two or more division photometry frames characterized by providing the following The procedure which computes the average a1 of the photometry brightness integral data of division photometry P of said two or more division photometry frames (P is three or more integers) The procedure which computes the average a3 of y photometry brightness integral data (however, 1<x<P) sampled from order with brightness low among said two or more division photometry frames The procedure which amends proper desired value Yr of exposure control using said average a1 and said average a3
[Claim 15] The image pick-up approach according to claim 14 characterized by amending in the direction which raises the proper desired value Yr of exposure control according to the value of (a1-a3) when the difference of said average a1 and said average a3 exceeds the predetermined threshold z.
[Claim 16] The amendment which raises the proper desired value Yr of exposure control according to

the value of the above (a1-a3) is the following formulas and Yr. = r + {(a1-a3) x (b/c)} .... It is the image pick-up approach according to claim 15 characterized by being carried out based on (3) and (the default set up by basing b and c on a correction factor, and basing r on a threshold z).

[Claim 17] The image pick-up approach of image pick-up equipment with two or more division photometry frames characterized by providing the following The procedure which computes the average a1 of the photometry brightness integral data of division photometry P of said two or more division photometry frames (P is three or more integers) The procedure which computes the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among said two or more division photometry frames The procedure which computes the average a3 of y photometry brightness integral data (however, 1<x<P) sampled from order with brightness low among said two or more division photometry frames The procedure which uses said average a3 for said average a1, said average a2, and a list, and amends proper desired value Yr of exposure control

[Claim 18] either the difference of said average a1 and said average a2, or the difference of said average a1 and said average a3 -- the image pick-up approach according to claim 17 characterized by amending the proper desired value Yr of exposure control in the vertical direction according to a value when the larger one exceeds the predetermined threshold z (a2-a1) (a1-a3).

[Claim 19] When the value of the above (a2-a1) exceeds the predetermined threshold z more greatly [the value of the above (a2-a1)] than the value of the above (a1-a3), The formula of the following [amendment / which lowers the proper desired value Yr of exposure control according to the value of the above (a2-a1)], Yr = r - {(a2-a1) x (b/c)} .... It is the image pick-up approach according to claim 18 characterized by being carried out based on (2) and (the default set up by basing b and c on a correction factor, and basing r on a threshold z).

[Claim 20] When the value of the above (a1-a3) exceeds the predetermined threshold z smaller [the value of the above (a2-a1)] than the value of the above (a1-a3), The formula of the following [amendment / which raises the proper desired value Yr of exposure control according to the value of the above (a1-a3)], Yr = r + {(a1-a3) x (b/c)} .... It is the image pick-up approach according to claim 18 characterized by being carried out based on (3) and (the default set up by basing b and c on a correction factor, and basing r on a threshold z).

[Claim 21] The record medium which memorized the program for operating a computer as each means included in said claim 1 thru/or image pick-up equipment given in any 1 of 10 and in which computer reading is possible.

[Claim 22] The record medium which memorized the program for performing each procedure included in the image pick-up approach of given in a computer said claim 11 thru/or any 1 of 20 and in which computer reading is possible.

[Procedure amendment 2]
[Document to be Amended] Specification
[Item(s) to be Amended] 0008
[Method of Amendment] Modification
[Proposed Amendment]
[0008]
[Means for Solving the Problem] This invention is characterized by having come out and providing the following to a certain image pick-up equipment according to claim 1, in order to attain with the above-mentioned purpose. Two or more division photometry frames A means to compute the average a1 of the photometry brightness integral data of division photometry P of said two or more division photometry frames (P is three or more integers) A means to compute the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among said two or more division photometry frames The means which amends proper desired value Yr of exposure control using said average a1 and said average a2

[Procedure amendment 3]
[Document to be Amended] Specification
[Item(s) to be Amended] 0011
[Method of Amendment] Modification
[Proposed Amendment]
[0011] Moreover, this invention is characterized by having come out and providing the following to a certain image pick-up equipment according to claim 4. Two or more division photometry frames A means to compute the average a1 of the photometry brightness integral data of division photometry P of

said two or more division photometry frames (P is three or more integers) A means to compute the average a3 of y photometry brightness integral data (however, 1<x<P) sampled from order with brightness low among said two or more division photometry frames The means which amends proper desired value Yr of exposure control using said average a1 and said average a2

[Procedure amendment 4]
[Document to be Amended] Specification
[Item(s) to be Amended] 0014
[Method of Amendment] Modification
[Proposed Amendment]
[0014] Moreover, this invention is characterized by having come out and providing the following to a certain image pick-up equipment according to claim 7. Two or more division photometry frames A means to compute the average a1 of the photometry brightness integral data of division photometry P of said two or more division photometry frames (P is three or more integers) A means to compute the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among said two or more division photometry frames A means to compute the average a3 of y photometry brightness integral data (however, 1<x<P) sampled from order with brightness low among said two or more division photometry frames, and the means which uses said average a3 for said average a1, said average a2, and a list, and amends proper desired value Yr of exposure control
[Procedure amendment 5]
[Document to be Amended] Specification
[Item(s) to be Amended] 0018
[Method of Amendment] Modification
[Proposed Amendment]
[0018] Moreover, it is characterized by the image pick-up approach of image pick-up equipment with two or more division photometry frames in the image pick-up approach according to claim 11 that this invention is this invention possessing the following. The procedure which computes the average a1 of the photometry brightness integral data of division photometry P of said two or more division photometry frames (P is three or more integers) The procedure which computes the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among said two or more division photometry frames The procedure which amends proper desired value Yr of exposure control using said average a1 and said average a2
[Procedure amendment 6]
[Document to be Amended] Specification
[Item(s) to be Amended] 0021
[Method of Amendment] Modification
[Proposed Amendment]
[0021] Moreover, it is characterized by the image pick-up approach of image pick-up equipment with two or more division photometry frames in the image pick-up approach according to claim 14 that this invention is this invention possessing the following. The procedure which computes the average a1 of the photometry brightness integral data of division photometry P of said two or more division photometry frames (P is three or more integers) The procedure which computes the average a3 of y photometry brightness integral data (however, 1<x<P) sampled from order with brightness low among said two or more division photometry frames The procedure which amends proper desired value Yr of exposure control using said average a1 and said average a3
[Procedure amendment 7]
[Document to be Amended] Specification
[Item(s) to be Amended] 0024
[Method of Amendment] Modification
[Proposed Amendment]
[0024] Moreover, it is characterized by the image pick-up approach of image pick-up equipment with two or more division photometry frames in the image pick-up approach according to claim 17 that this invention is this invention possessing the following. The procedure which computes the average a1 of the photometry brightness integral data of division photometry P of said two or more division photometry frames (P is three or more integers) The procedure which computes the average a2 of x photometry brightness integral data (however, 1<x<P) sampled from order with brightness high among said two or more division photometry frames The procedure which computes the average a3 of y

photometry brightness integral data (however, 1<x<P) sampled from order with brightness low among said two or more division photometry frames The procedure which uses said average a3 for said average a1, said average a2, and a list, and amends proper desired value Yr of exposure control

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[Translation done.]

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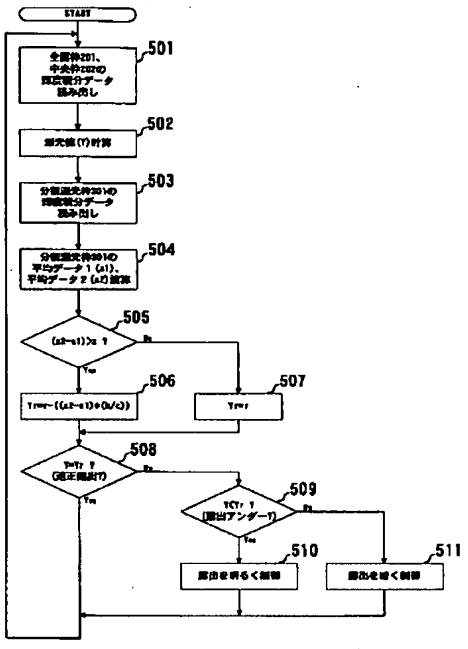
(54)【発明の名称】　撮像装置及び方法、並びにコンピュータ読み取り可能な記録媒体

(57)【要約】
【課題】　輝度コントラストが極端に異なる被写体が同一画角内にあっても、好適な適性露出制御が可能な撮像装置、撮像方法、並びに記録媒体を提供する。
【解決手段】　ｍ×ｎ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出するステップと、ｍ×ｎ個の分割測光枠の内、輝度の高い順からサンプリングしたｘ個の測光輝度積分データの平均値ａ２を算出するステップと、前記平均値ａ１と前記平均値ａ２との差分が、所定の閾値ｚを越えた場合、（ａ２－ａ１）の値に応じて、露出制御の適正目標値を下げる方向に補正を行うステップとを含む。



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【特許請求の範囲】

【請求項１】　Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像装置であって、
Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手段と、
Ｐ個の分割測光枠の内、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手段と、
前記平均値ａ１と前記平均値ａ２を用いて、露光制御の＊

$$Yr = r - \{(a2-a1) \times (b/c)\} \quad \cdots\cdots (1)$$

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項２に記載の撮像装置。

【請求項４】　Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像装置であって、
Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手段と、
Ｐ個の分割測光枠の内、輝度の低い順からサンプリングしたｙ個（但し、１＜ｙ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手段と、　※20

$$Yr = r + \{(a1-a3) \times (b/c)\} \quad \cdots\cdots (3)$$

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項５に記載の撮像装置。

【請求項７】　Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像装置であって、
Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手段と、
Ｐ個の分割測光枠の内、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの　30
平均値ａ２を算出する手段と、
Ｐ個の分割測光枠の内、輝度の低い順からサンプリングしたｙ個（但し、１＜ｙ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手段と、
前記平均値ａ１、前記平均値ａ２、並びに前記平均値ａ★

$$Yr = r - \{(a2-a1) \times (b/c)\} \quad \cdots\cdots (2)$$

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項８に記載の撮像装置。

【請求項１０】　前記（ａ２－ａ１）の値が前記（ａ１☆40

$$Yr = r + \{(a1-a3) \times (b/c)\} \quad \cdots\cdots (3)$$

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項８に記載の撮像装置。

【請求項１１】　Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像方法であって、
Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手順と、
Ｐ個の分割測光枠の内、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの　50

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＊適正目標値Ｙｒの補正を行う手段と、
を備えたことを特徴とする撮像装置。

【請求項２】　前記平均値ａ１と前記平均値ａ２との差分が、所定の閾値ｚを越えた場合、（ａ２－ａ１）の値に応じて、露出制御の適正目標値Ｙｒを下げる方向に補正を行うことを特徴とする請求項１に記載の撮像装置。

【請求項３】　前記（ａ２－ａ１）の値に応じて露出制御の適正目標値Ｙｒを下げる補正は以下の計算式、

※前記平均値ａ１と前記平均値ａ３を用いて、露光制御の適正目標値Ｙｒの補正を行う手段と、
を備えたことを特徴とする撮像装置。

【請求項５】　前記平均値ａ１と前記平均値ａ３との差分が、所定の閾値ｚを越えた場合、（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる方向に補正を行うことを特徴とする請求項４に記載の撮像装置。

【請求項６】　前記（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、

★３を用いて露光制御の適正目標値Ｙｒの補正を行う手段と、
を備えたことを特徴とする撮像装置。

【請求項８】　前記平均値ａ１と前記平均値ａ２との差分、または前記平均値ａ１と前記平均値ａ３との差分のどちらか大きい方が、所定の閾値ｚを越えた場合、（ａ２－ａ１）または（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上下方向に補正することを特徴とする請求項７に記載の撮像装置。

【請求項９】　前記（ａ２－ａ１）の値が前記（ａ１－ａ３）の値より大きく、且つ前記（ａ２－ａ１）の値が所定の閾値ｚを越えた場合、前記（ａ２－ａ１）の値に応じて露出制御の適正目標値Ｙｒを下げる補正は以下の計算式、

☆－ａ３）の値より小さく、且つ前記（ａ１－ａ３）の値が所定の閾値ｚを越えた場合、前記（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、

平均値ａ２を算出する手順と、
前記平均値ａ１と前記平均値ａ２を用いて、露光制御の適正目標値Ｙｒの補正を行う手順と、
を含むことを特徴とする撮像方法。

【請求項１２】　前記平均値ａ１と前記平均値ａ２との差分が、所定の閾値ｚを越えた場合、（ａ２－ａ１）の値に応じて、露出制御の適正目標値Ｙｒを下げる方向に補正を行うことを特徴とする請求項１１に記載の撮像方法。

【請求項１３】　前記（ａ２－ａ１）の値に応じて露出＊
＊制御の適正目標値Ｙｒを下げる補正は以下の計算式、

$$Yr = r - \{(a2-a1) \times (b/c)\} \quad \cdots\cdots(1)$$

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項１２に記載の撮像方法。

【請求項１４】　Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像方法であって、
Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手順と、
Ｐ個の分割測光枠の内、輝度の低い順からサンプリングしたｙ個（但し、１＜ｙ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手順と、
※前記平均値ａ１と前記平均値ａ３を用いて、露光制御の適正目標値Ｙｒの補正を行う手順と、
を含むことを特徴とする撮像方法。

【請求項１５】　前記平均値ａ１と前記平均値ａ３との差分が、所定の閾値ｚを越えた場合、（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる方向に補正を行うことを特徴とする請求項１４に記載の撮像方法。

【請求項１６】　前記（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、

$$Yr = r + \{(a1-a3) \times (b/c)\} \quad \cdots\cdots(3)$$

★３を用いて露光制御の適正目標値Ｙｒの補正を行う手順と、
を含むことを特徴とする撮像方法。

【請求項１７】　Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像方法であって、
Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手順と、
Ｐ個の分割測光枠の内、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手順と、
Ｐ個の分割測光枠の内、輝度の低い順からサンプリングしたｙ個（但し、１＜ｙ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手順と、
前記平均値ａ１、前記平均値ａ２、並びに前記平均値ａ★

【請求項１８】　前記平均値ａ１と前記平均値ａ２との差分、または前記平均値ａ１と前記平均値ａ３との差分のどちらか大きい方が、所定の閾値ｚを越えた場合、（ａ２－ａ１）または（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上下方向に補正することを特徴とする請求項１７に記載の撮像方法。

【請求項１９】　前記（ａ２－ａ１）の値が前記（ａ１－ａ３）の値より大きく、且つ前記（ａ２－ａ１）の値が所定の閾値ｚを越えた場合、前記（ａ２－ａ１）の値に応じて露出制御の適正目標値Ｙｒを下げる補正は以下の計算式、

$$Yr = r - \{(a2-a1) \times (b/c)\} \quad \cdots\cdots(2)$$

☆－ａ３）の値より小さく、且つ前記（ａ１－ａ３）の値が所定の閾値ｚを越えた場合、前記（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、

$$Yr = r + \{(a1-a3) \times (b/c)\} \quad \cdots\cdots(3)$$

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項１５に記載の撮像方法。

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項１８に記載の撮像方法。

【請求項２０】　前記（ａ２－ａ１）の値が前記（ａ１☆

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項１８に記載の撮像方法。

【請求項２１】　コンピュータを前記請求項１乃至１０のいずれか１に記載の撮像装置に含まれる各手段として機能させるためのプログラムを記憶したコンピュータ読み取り可能な記録媒体。

【請求項２２】　コンピュータに前記請求項１１乃至２０のいずれか１に記載の撮像方法に含まれる各手順を実行させるためのプログラムを記憶したコンピュータ読み取り可能な記録媒体。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、撮像装置及び方法に係り、特に輝度コントラストが極端に異なる被写体が同一画角内にあっても、好適な適性露出制御を実現し得る撮像装置、撮像方法、並びにコンピュータ読み取り可能な記録媒体に関する。

【０００２】

【従来の技術】従来、露出制御のための測光方式として、図７に示す如くに、画面全体（全体枠２０１の内側）の平均輝度信号レベルを積分することにより求め、同様に中央部分（中央枠２０２の内側）の平均輝度信号レベルを積分することにより求め、これらを組み合わせ、画面中央の被写体（中央枠２０２の内側）に重点を置いた露出評価信号を生成することで、測光を行う「中央重点測光」が広く用いられている。

【０００３】しかしながら、上記従来において広く用いられている「中央重点測光」は、主被写体が画面中央に存在することを前提としており、主被写体が画面中央部分（例えば、中央枠２０２の内側）から外れた位置に存在するような場合、主被写体以外の被写体に対して測光（露出制御）がなされてしまうという問題があった。

【０００４】例えば、図８に示す如くに、暗い背景で、

主被写体である黒い服を着た人物の服の部分が画面中央に存在し、顔が中央上部に存在した場合、中央にある黒い服の部分が適正露出となるように露出制御が行われてしまうため、絞りを開ける方向に制御がなされ、主被写体である人物の顔が白飛びしてしまった映像になってしまう。尚、図７及び図８は従来の撮像装置における露出制御動作を説明するための図である。

【０００５】また、輝度コントラストが極端に異なる被写体が同一画面内にあった場合等においても、固定的に画面中央の被写体に重点を置いた露出制御が行われてしまうため、目的とする被写体に極端な白トビや黒つぶれが発生してしまうという問題があった。

【０００６】

【発明が解決しようとする課題】以上述べたように、従来の撮像装置では、画面中央に存在する被写体に対して露出制御がなされるようになっているため、輝度コントラストが極端に異なる被写体が同一画面内にあった場合等に、目的とする被写体に極端な白トビや黒つぶれが発生してしまうといった問題があった。

【０００７】本発明は、上記問題に鑑みてなされたものであり、輝度コントラストが極端に異なる被写体が同一画角内にあっても、好適な適性露出制御を可能とし得る＊（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする。

【００１１】また、本発明である請求項４に記載の撮像装置は、Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像装置であって、Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手段と、Ｐ個の分割測光枠の内、輝度の低い順からサンプリングしたｙ個（但し、１＜ｙ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手段と、前記平均値ａ１と前記平均値ａ３を用いて、露光制御の適正目標値Ｙｒの補正を行※（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする。

【００１４】また、本発明である請求項７に記載の撮像装置は、Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像装置であって、Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手段と、Ｐ個の分割測光枠の内、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手段と、Ｐ個の分割測光枠の内、輝度の低い順からサンプリングしたｙ個（但し、１＜ｙ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手段と、前記平均値ａ１、前記平均値ａ２、並びに前記平均値ａ３を用いて露光制御の適正目標値Ｙｒの補正を行う手段とを備えたことを特徴とする。★（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定され

＊撮像装置、撮像方法、並びにコンピュータ読み取り可能な記録媒体を提供することを目的とするものである。

【０００８】

【課題を解決するための手段】上記目的を達成するため、本発明である請求項１に記載の撮像装置は、Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像装置であって、Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手段と、Ｐ個の分割測光枠の内、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手段と、前記平均値ａ１と前記平均値ａ２を用いて、露光制御の適正目標値Ｙｒの補正を行う手段とを備えたことを特徴とする。

【０００９】また、本発明である請求項２に記載の撮像装置は、前記平均値ａ１と前記平均値ａ２との差分が、所定の閾値ｚを越えた場合、（ａ２－ａ１）の値に応じて、露出制御の適正目標値Ｙｒを下げる方向に補正を行うことを特徴とする。

【００１０】また、本発明である請求項３に記載の撮像装置は、前記（ａ２－ａ１）の値に応じて露出制御の適正目標値Ｙｒを下げる補正は以下の計算式、

$$Yr = r - \{(a2-a1) \times (b/c)\} \quad \cdots\cdots(1)$$

※う手段とを備えたことを特徴とする。

【００１２】また、本発明である請求項５に記載の撮像装置は、前記平均値ａ１と前記平均値ａ３との差分が、所定の閾値ｚを越えた場合、（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる方向に補正を行うことを特徴とする。

【００１３】また、本発明である請求項６に記載の撮像装置は、前記（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、

$$Yr = r + \{(a1-a3) \times (b/c)\} \quad \cdots\cdots(3)$$

★【００１５】また、本発明である請求項８に記載の撮像装置は、前記平均値ａ１と前記平均値ａ２との差分、または、前記平均値ａ１と前記平均値ａ３との差分のどちらか大きい方が、所定の閾値ｚを越えた場合、（ａ２－ａ１）または（ａ１－ａ３）の値に応じて、露出制御の適正目標値Ｙｒを、上下方向に補正することを特徴とする。

【００１６】また、本発明である請求項９に記載の撮像装置は、前記（ａ２－ａ１）の値が前記（ａ１－ａ３）の値より大きく、且つ前記（ａ２－ａ１）の値が所定の閾値ｚを越えた場合、前記（ａ２－ａ１）の値に応じて露出制御の適正目標値Ｙｒを下げる補正は以下の計算式、

★

$$Yr = r - \{(a2-a1) \times (b/c)\} \quad \cdots\cdots(2)$$

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする。

【００１７】また、本発明である請求項１０に記載の撮像装置は、前記（ａ２－ａ１）の値が前記（ａ１－ａ３）の値より小さく、且つ前記（ａ１－ａ３）の値が所＊定の閾値ｚを越えた場合、前記（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、

Ｙｒ　＝　ｒ　＋　｛（ａ１－ａ３）　×　（ｂ／ｃ）｝　……（３）

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする。

【００１８】また、本発明である請求項１１に記載の撮像方法は、Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像方法であって、Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手順と、Ｐ個の分割測光枠の内、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手順と、前記平均値ａ１と前記平均値ａ２を用いて、露光制御の適正目標値Ｙｒの補正を※

Ｙｒ　＝　ｒ　－　｛（ａ２－ａ１）　×　（ｂ／ｃ）｝　……（１）

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする。

【００２１】また、本発明である請求項１４に記載の撮像方法は、Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像方法であって、Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手順と、Ｐ個の分割測光枠の内、輝度の低い順からサンプリングしたｙ個（但し、１＜ｙ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手順と、前記平均値ａ１と前記平均値ａ３を用いて、露光制御の適正目標値Ｙｒの補正を★

Ｙｒ　＝　ｒ　＋　｛（ａ１－ａ３）　×　（ｂ／ｃ）｝　……（３）

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする。

【００２４】また、本発明である請求項１７に記載の撮像方法は、Ｐ個（Ｐは３以上の整数）の分割測光枠を有した撮像方法であって、Ｐ個の分割測光枠の全枠における測光輝度積分データの平均値ａ１を算出する手順と、Ｐ個の分割測光枠の内、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手順と、Ｐ個の分割測光枠の内、輝度の低い順からサンプリングしたｙ個（但し、１＜ｙ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手順と、前記平均値ａ１、前記平均値ａ２、並びに前記平均値ａ３を用いて露光制御の適正目標値Ｙｒの補正を行う手順とを含むことを特徴とする。☆

Ｙｒ　＝　ｒ　－　｛（ａ２－ａ１）　×　（ｂ／ｃ）｝　……（２）

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする。

【００２７】また、本発明である請求項２０に記載の撮像方法は、前記（ａ２－ａ１）の値が前記（ａ１－ａ◆

Ｙｒ　＝　ｒ　＋　｛（ａ１－ａ３）　×　（ｂ／ｃ）｝　……（３）

（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする。

【００２８】また、本発明である請求項２１に記載のコンピュータ読み取り可能な記録媒体は、コンピュータを＊行う手順とを含むことを特徴とする。

【００１９】また、本発明である請求項１２に記載の撮像方法は、前記平均値ａ１と前記平均値ａ２との差分が、所定の閾値ｚを越えた場合、（ａ２－ａ１）の値に応じて、露出制御の適正目標値Ｙｒを下げる方向に補正を行うことを特徴とする。

【００２０】また、本発明である請求項１３に記載の撮像方法は、前記（ａ２－ａ１）の値に応じて露出制御の適正目標値Ｙｒを下げる補正は以下の計算式、

Ｙｒ　＝　ｒ　－　｛（ａ２－ａ１）　×　（ｂ／ｃ）｝　……（１）

★行う手順とを含むことを特徴とする。

【００２２】また、本発明である請求項１５に記載の撮像方法は、前記平均値ａ１と前記平均値ａ３との差分が、所定の閾値ｚを越えた場合、（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる方向に補正を行うことを特徴とする。

【００２３】また、本発明である請求項１６に記載の撮像方法は、前記（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、

Ｙｒ　＝　ｒ　＋　｛（ａ１－ａ３）　×　（ｂ／ｃ）｝　……（３）

☆【００２５】また、本発明である請求項１８に記載の撮像方法は、前記平均値ａ１と前記平均値ａ２との差分、または前記平均値ａ１と前記平均値ａ３との差分のどちらか大きい方が、所定の閾値ｚを越えた場合、（ａ２－ａ１）または（ａ１－ａ３）の値に応じて、露出制御の適正目標値Ｙｒを、上下方向に補正することを特徴とする。

【００２６】また、本発明である請求項１９に記載の撮像方法は、前記（ａ２－ａ１）の値が前記（ａ１－ａ３）の値より大きく、且つ前記（ａ２－ａ１）の値が所定の閾値ｚを越えた場合、前記（ａ２－ａ１）の値に応じて露出制御の適正目標値Ｙｒを下げる補正は以下の計算式、

Ｙｒ　＝　ｒ　－　｛（ａ２－ａ１）　×　（ｂ／ｃ）｝　……（２）

◆３）の値より小さく、且つ前記（ａ１－ａ３）の値が所定の閾値ｚを越えた場合、前記（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、

Ｙｒ　＝　ｒ　＋　｛（ａ１－ａ３）　×　（ｂ／ｃ）｝　……（３）

前記請求項１乃至１０のいずれか１に記載の撮像装置に含まれる各手段として機能させるためのプログラムを記憶したことを特徴とする。

【００２９】また、本発明である請求項２２に記載のコ

ンピュータ読み取り可能な記録媒体は、コンピュータに前記請求項１１乃至２０のいずれか１に記載の撮像方法に含まれる各手順を実行させるためのプログラムを記憶したことを特徴とする。

【００３０】上記発明によれば、画面中央部分に重点を置きつつ、画面中の分割測光枠における輝度分布の傾向に応じて、露出制御の適正目標値を補正するようにしたので、輝度コントラストが極端に異なる被写体が同一画面内にあっても、被写体の極端な白トビや黒つぶれを防止することができ、好適な被写体像を撮影することが可能となる。

【００３１】

【発明の実施の形態】以下、本発明の実施の形態について、図面を参照して詳細に説明する。

【００３２】図１は、本発明における撮像装置の構成を示したブロック図である。図１に示す如くに、本発明における撮像装置は、レンズユニット１０１、レンズ１０２、絞り１０３、撮像素子１０４、ＣＤＳ（相関二重サンプリング）１０５、ＡＧＣ（自動利得制御）１０６、カメラ信号処理部１０７、ゲート回路１０８、積分回路１０９、Ａ／Ｄ変換回路１１０、タイミングジェネレータ（ＴＧ）１１１、絞り制御回路１１２、カメラ制御部１１３により構成される。

【００３３】レンズ１０２より入射した被写体光は、絞り１０３を通り、ＣＣＤ等の撮像素子１０４上に結像する。結像した被写体光は、撮像素子１０４により光電変換され、映像信号としてレンズユニット１０１の外部に出力される。光電変換された映像信号はＣＤＳ１０５，ＡＧＣ１０６を通り、カメラ信号処理部１０７と測光エリアを設定するためのゲート回路１０８に供給される。

【００３４】ゲート回路１０８に供給された映像信号は、該当測光エリア内の輝度信号が検波分離され、積分回路１０９に供給され、積分処理される。積分された輝度信号はＡ／Ｄ変換回路１１０を通しデジタル信号に変換され、露出評価信号としてカメラ制御部１１３に供給される。

【００３５】輝度積分データを供給されたカメラ制御部１１３は、それをもとに露出を判断し、露出が適正となるように撮像素子（ＣＣＤ）１０４のシャッター速度を制御するタイミングジェネレータ（ＴＧ）１１１、絞り制御回路１１２，ＡＧＣ１０６を制御する。

【００３６】（第１の実施の形態）以下、図２を参照して本発明の第１の実施の形態について説明を行う。図２は本発明の撮像装置の第１の実施の形態におけるカメラ制御部１１３の露出制御動作を示したフローチャートである。

【００３７】本実施の形態では、図３に示す如くに、撮像素子１０４にて撮像される全画面を、８×８＝６４個の分割測光枠からなるメッシュサイズ（ｍ×ｎ）に分割し、測光に使用される分割測光枠のサンプリング数ｘが１６個であるものとして説明を行う。尚、図３は本発明の撮像装置における露出制御動作を説明するための図である。また、ｍ及びｎは、それぞれ２以上の整数であり、サンプリング数ｘは１より大きく（ｍ×ｎ）より小さい整数である。

【００３８】先ず、カメラ制御部１１３は、積分回路１０９にて積分された図７における全面枠２０１及び中央枠２０２の輝度積分データをそれぞれ取得し（ステップ５０１）、該取得された全面枠２０１の輝度積分データ及び中央枠２０２の輝度積分データから、画面測光値Ｙを算出する（ステップ５０２）。尚、画面測光値Ｙの算出方法は従来と同様（周知）であり、且つ撮像装置の特性（構成）等によって異なるので、ここでの説明は省略する。

【００３９】次に、カメラ制御部１１３は、積分回路１０９にて積分された、図３における分割測光枠３０１の全枠（６４個）における輝度積分データを取得し（ステップ５０３）、該取得された分割測光枠３０１の全枠（６４個）の輝度積分データより、全６４枠の輝度積分データの平均値ａ１と、輝度の高い順からサンプリング数ｘだけサンプリングした１６枠の輝度積分データの平均値ａ２を算出する（ステップ５０４）。

【００４０】次に、ステップ５０５おいて、（ａ２－ａ１）の計算値が、閾値ｚより大きいか、または小さいかが判断される。ステップ５０５にて、（ａ２－ａ１）の計算値が閾値ｚより小さいと判断された場合には、露出適正目標値Ｙｒを、閾値ｚに基づいて設定された既定値ｒとする（ステップ５０７）。尚、閾値ｚは、撮像装置の特性（構成）、例えばレンズの径や撮像素子の画素数等に基づいて決定される値（正の実数）である。

【００４１】ステップ５０５にて、（ａ２－ａ１）の計算値が閾値ｚより大きいと判断された場合には、以下に示す計算式（１）により、新しい露出適性目標値Ｙｒを設定する（ステップ５０６）。

$$Yr = r - \{(a2 - a1) \times (b / c)\} \quad \cdots\cdots (1)$$

ここで、ｂ及びｃは補正係数であり、この値により補正の効きを調節する。

【００４２】この制御（ステップ５０５，５０６，５０７）による（ａ２－ａ１）の値に従った適正目標値の変化を図４に示す。図４は第１の実施の形態における（ａ２－ａ１）の値に従った適正目標値の変化を示したグラフである。すなわち、上述したように、（ａ２－ａ１）の計算値が閾値ｚより小さい場合、適正目標値は一定値（既定値ｒ）となり、（ａ２－ａ１）の計算値が閾値ｚより大きい場合、適正目標値は式（１）にしたがって単調減少する。

【００４３】以上の処理により、適正目標値Ｙｒが設定された以降は、従来と同様に露出状態に基づいて、絞り１０３やシャッタースピードやＡＧＣ１０６等を制御

し、露出（画面測光値Ｙ）が適正目標値Ｙｒと同じとなるように露出制御を行う（ステップ５０８，５０９，５１０，５１１）。

【００４４】（第２の実施の形態）次に、図５を参照して本発明の第２の実施の形態について説明を行う。図５は本発明の撮像装置の第２の実施の形態におけるカメラ制御部１１３の露出制御動作を示したフローチャートである。

【００４５】本実施の形態においても、第１の実施の形態と同様、図３に示す如くに、撮像素子１０４にて撮像される全画面を、８×８＝６４個の分割測光枠からなるメッシュサイズ（ｍ×ｎ）に分割し、測光に使用される分割測光枠のサンプリング数ｘが１６個であるものとして説明を行う。尚、ｍ及びｎは、それぞれ、２以上の整数であり、サンプリング数ｘは、１より大きく（ｍ×ｎ）より小さい整数である。

【００４６】先ず、カメラ制御部１１３は、積分回路１０９にて積分された図７における全面枠２０１及び中央枠２０２の輝度積分データをそれぞれ取得し（ステップ６０１）、該取得された全面枠２０１の輝度積分データ及び中央枠２０２の輝度積分データから、画面測光値Ｙを算出する（ステップ６０２）。尚、画面測光値Ｙの算出方法は従来と同様（周知）であり、且つ撮像装置の特性（構成）等によって異なるので、ここでの説明は省略する。

【００４７】次に、カメラ制御部１１３は、積分回路１＊０９にて積分された、図３における分割測光枠３０１の全枠（６４個）における輝度積分データを取得し（ステップ６０３）、該取得された分割測光枠３０１の全枠（６４個）の輝度積分データより、全６４枠の輝度積分データの平均値ａ１と、輝度の高い順からサンプリング数ｘだけサンプリングした１６枠の輝度積分データの平均値ａ２と、輝度の低い順からサンプリングした１６枠の輝度積分データの平均値ａ３を算出する（ステップ６０４）。

$$Yr = r - \{(a2-a1) \times (b/c)\} \quad \cdots\cdots(2)$$

ここで、ｂ及びｃは補正係数であり、この値により補正の効きを調節する。

【００５０】一方、ステップ６０５にて、（ａ２－ａ１）の計算値が（ａ１－ａ３）の計算値よりも小さい場合、ステップ６０９にて、（ａ１－ａ３）の計算値が閾値ｚより大きいか、または小さいかが判断される。ステップ６０９にて、（ａ１－ａ３）の計算値が閾値ｚより＊※小さいと判断された場合には、露出適正目標値Ｙｒを、閾値ｚに基づいて設定された既定値ｒとする（ステップ６０８）。

$$Yr = r + \{(a1-a3) \times (b/c)\} \quad \cdots\cdots(3)$$

ここで、ｂ及びｃは補正係数であり、この値により補正の効きを調節する。

【００５２】この制御（ステップ６０５，６０６，６０７，６０８，６０９，６１０）による（ａ２－ａ１）の値に従った適正目標値の変化を図６に示す。図６は第２の実施の形態における（ａ２－ａ１）の値に従った適正目標値の変化を示したグラフである。

【００５３】すなわち、上述したように、（ａ２－ａ１）の計算値が（ａ１－ａ３）の計算値より小さく、且つ（ａ２－ａ１）の計算値が閾値ｚより小さい場合、適正目標値は一定値（既定値ｒ）となり、（ａ２－ａ１）の計算値が閾値ｚより大きい場合、適正目標値は式（２）にしたがって単調減少する。

【００５４】また、（ａ２－ａ１）の計算値が（ａ１－ａ３）の計算値より大きく、且つ（ａ１－ａ３）の計算値が閾値ｚより小さい場合、適正目標値は一定値（既定値ｒ）となり、（ａ１－ａ３）の計算値が閾値ｚより大きい場合、適正目標値は式（３）にしたがって単調増加する。

【００５５】以上の処理により、適正目標値Ｙｒが設定された以降は、従来と同様に露出状態に基づいて、絞り１０３やシャッタースピードやＡＧＣ１０６等を制御し、露出（画面測光値Ｙ）が適正目標値Ｙｒと同じとなるように露出制御を行う（ステップ６１１，６１２，６１３，６１４）。

【００５６】上記発明によれば、画面中央部分に重点を置きつつ、画面全体の中のコントラスト分布の傾向により被写体の極端な白トビや黒つぶれを防止することができるため、輝度コントラストが極端に異なる被写体が同一画面内にあっても、好適な被写体像を撮影することが

【００４８】次に、ステップ６０５において、（ａ２－ａ１）の計算値と、（ａ１－ａ３）の計算値のどちらが大きいかが判断される。ステップ６０５にて、（ａ２－ａ１）の計算値が（ａ１－ａ３）の計算値よりも大きい場合、ステップ６０６にて、（ａ２－ａ１）の計算値が閾値ｚより大きいか、または小さいかが判断される。ステップ６０６にて、（ａ２－ａ１）の計算値が閾値ｚより小さいと判断された場合には、露出適正目標値Ｙｒを、閾値ｚに基づいて設定された既定値ｒとする（ステップ５０７）。尚、閾値ｚは、撮像装置の特性（構成）、例えばレンズの径や撮像素子の画素数等に基づいて決定される値（正の実数）である。

【００４９】ステップ６０６にて、（ａ２－ａ１）の計算値が閾値ｚより大きいと判断された場合には、以下に示す計算式（２）により、新しい露出適性目標値Ｙｒを設定する（ステップ６０７）。

可能となる。

【００５７】また、上記発明によれば、メッシュ状（ｍ×ｎ）に分割測光枠を有する撮像装置を説明したが、１ライン状（１×ｎ：ｎは３以上の整数）に分割測光枠を有するものであってもよい。

【００５８】尚、上記の本発明は、複数の機器から構成されるシステムに適用しても１つの機器からなる装置に適用しても良い。また、上述した実施形態の機能を実現するべく各種のデバイスを動作させるように、該各種デバイスと接続された装置あるいはシステム内のコンピュータに対し、上記実施形態の機能を実現するためのソフトウェアのプログラムコードを供給し、そのシステムあるいは装置のコンピュータ（ＣＰＵあるいはＭＰＵ）に格納されたプログラムに従って上記各種デバイスを動作させることによって実施したものも、本発明の範疇に含まれる。

【００５９】また、この場合、上記ソフトウェアのプログラムコード自体が上述した実施形態の機能を実現することになり、そのプログラムコード自体、およびそのプログラムコードをコンピュータに供給するための手段、例えばかかるプログラムコードを格納した記録媒体は本発明を構成する。かかるプログラムコードを記憶する記録媒体としては、例えばフロッピーディスク、ハードディスク、光ディスク、光磁気ディスク、ＣＤ－ＲＯＭ、磁気テープ、不揮発性のメモリカード、ＲＯＭ等を用いることができる。

【００６０】また、コンピュータが供給されたプログラムコードを実行することにより、上述の実施形態の機能が実現されるだけでなく、そのプログラムコードがコンピュータにおいて稼働しているＯＳ（オペレーティングシステム）あるいは他のアプリケーションソフト等と共同して上述の実施形態の機能が実現される場合にもかかるプログラムコードは本発明の実施形態に含まれることは言うまでもない。

【００６１】さらに、供給されたプログラムコードがコンピュータの機能拡張ボードやコンピュータに接続された機能拡張ユニットに備わるメモリに格納された後、そのプログラムコードの指示に基づいてその機能拡張ボードや機能拡張ユニットに備わるＣＰＵ等が実際の処理の一部または全部を行い、その処理によって上述した実施形態の機能が実現される場合にも本発明に含まれることは言うまでもない。

【００６２】尚、上記実施形態において示した各部の形状および構造は、何れも本発明を実施するにあたっての具体化のほんの一例を示したものに過ぎず、これらによって本発明の技術的範囲が限定的に解釈されてはならないものである。すなわち、本発明はその精神、またはその主要な特徴から逸脱することなく、様々な形で実施することができる。

【００６３】

【発明の効果】以上説明したように本発明によれば、画面中央部分に重点を置きつつ、画面中の分割測光枠における輝度分布の傾向に応じて、露出制御の適正目標値を補正することにより被写体の極端な白トビや黒つぶれを防止することができ、輝度コントラストが極端に異なる被写体が同一画面内にあっても、好適な被写体像を撮影することができる。

【図面の簡単な説明】

【図１】本発明における撮像装置の構成を示したブロック図である。

【図２】本発明の撮像装置の第１の実施の形態におけるカメラ制御部の露出制御動作を示したフローチャートである。

【図３】本発明の撮像装置における露出制御動作を説明するための図である。

【図４】第１の実施の形態における（ａ２－ａ１）の値に従った適正目標値の変化を示したグラフである。

【図５】本発明の撮像装置の第２の実施の形態におけるカメラ制御部１１３の露出制御動作を示したフローチャートである。

【図６】第２の実施の形態における（ａ２－ａ１）の値に従った適正目標値の変化を示したグラフである。

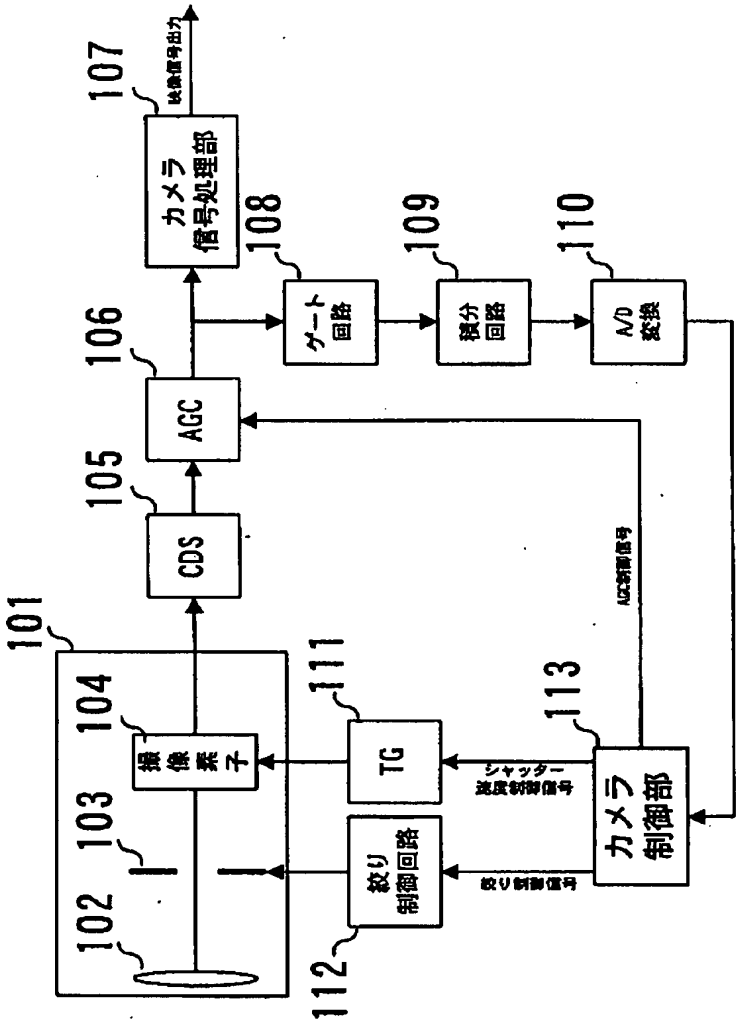
【図７】従来の撮像装置における露出制御動作を説明するための図である。

【図８】従来の撮像装置における露出制御動作を説明するための図である。

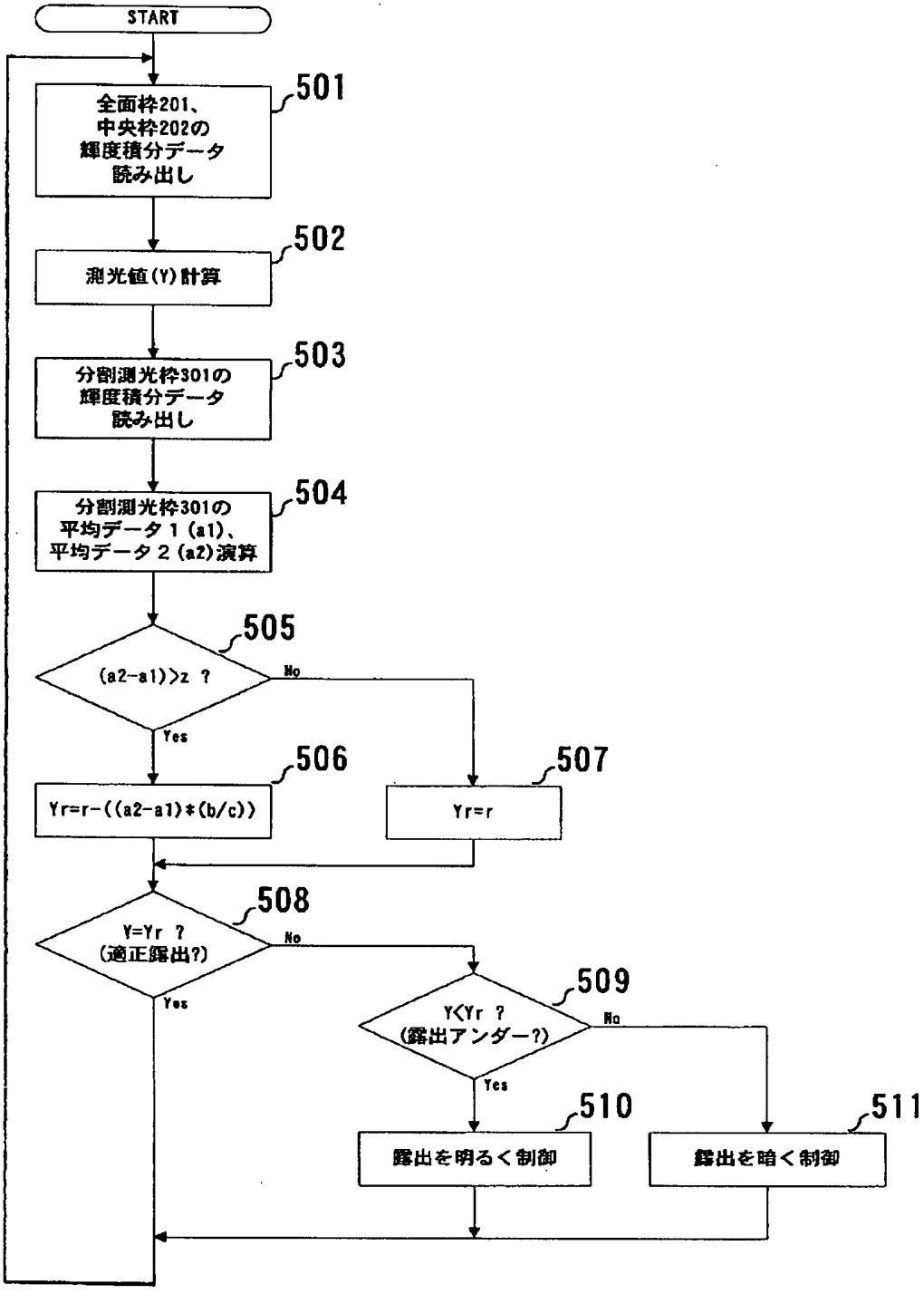
【符号の説明】

１０１　レンズユニット
１０２　レンズ
１０３　絞り
１０４　撮像素子
１０５　ＣＤＳ回路
１０６　ＡＧＣ回路
１０７　カメラ信号処理部
１０８　測光枠ゲート発生回路
１０９　輝度信号積分回路
１１０　Ａ／Ｄ変換回路
１１１　撮像素子タイミングジェネレータ
１１２　絞り制御回路
１１３　カメラ制御部
２０１　全面測光枠
２０２　中央測光枠
３０１　分割測光枠

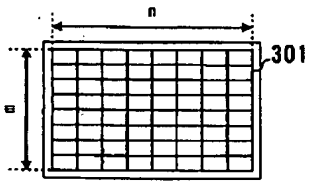
【図１】


101
102
103
104
105
106
107
108
109
110
111
112
113
撮像素子
CDS
AGC
カメラ信号処理部
ゲート回路
積分回路
A/D変換
TG
絞り制御回路
カメラ制御部
シャッター速度制御信号
絞り制御信号
AGC制御信号

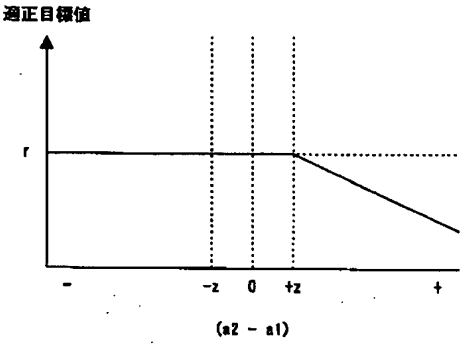
【図２】


START
全面枠201、
中央枠202の
輝度積分データ
読み出し
501
測光値(Y)計算
502
分割測光枠301の
輝度積分データ
読み出し
503
分割測光枠301の
平均データ１(a1)、
平均データ２(a2)演算
504
(a2-a1)>z ?
505
No
Yes
Yr=r-((a2-a1)*(b/c))
506
Yr=r
507
Y=Yr ?
(適正露出?)
508
No
Yes
Y<Yr ?
(露出アンダー?)
509
No
Yes
露出を明るく制御
510
露出を暗く制御
511

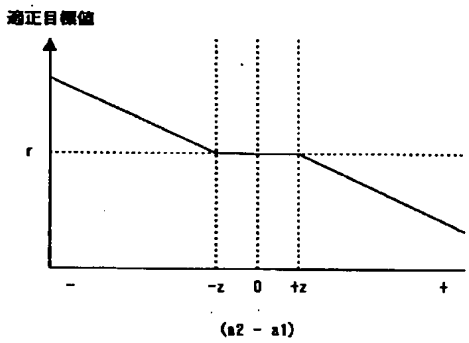
【図３】



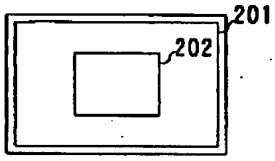
【図４】



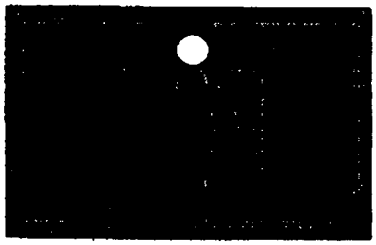
【図６】



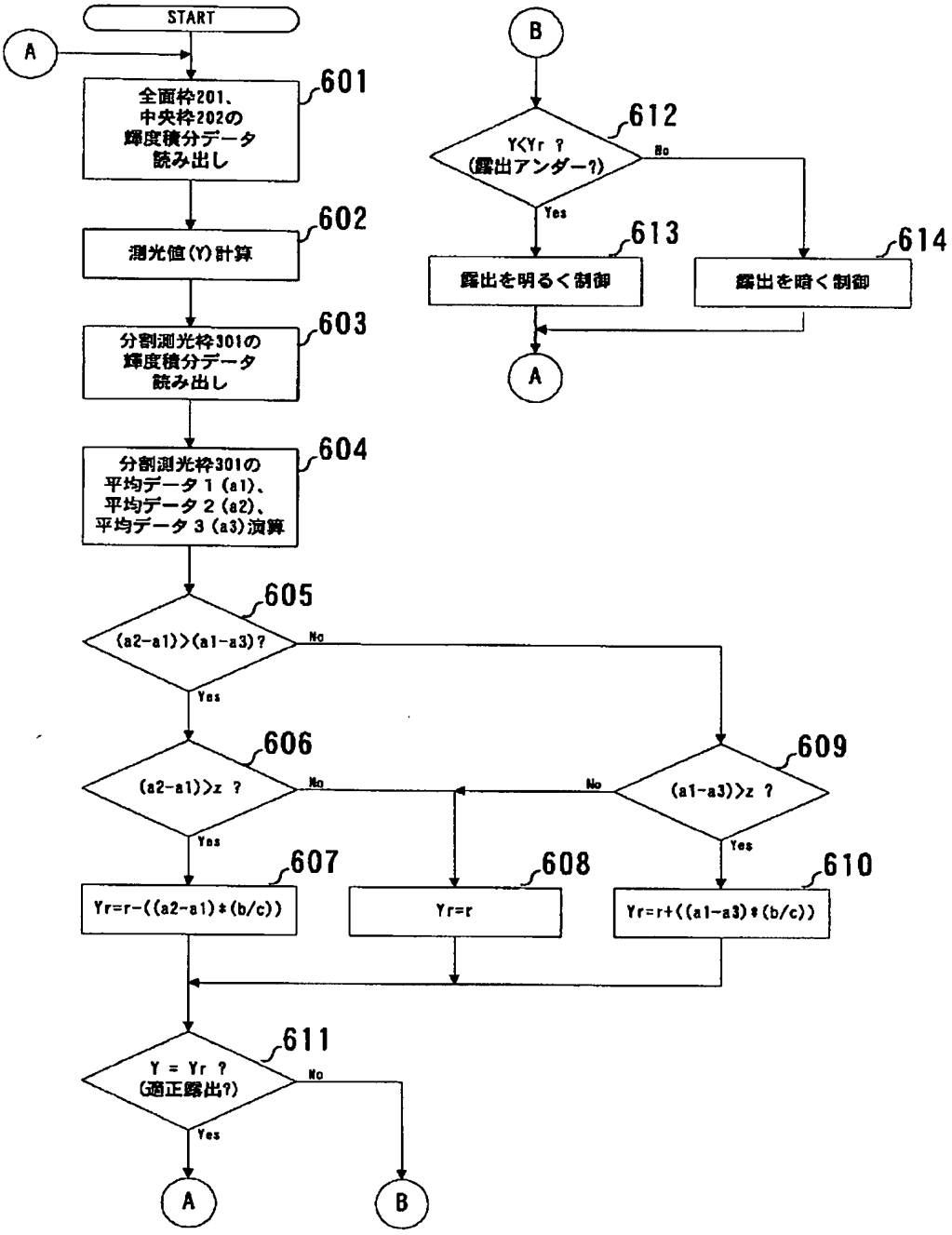
【図７】



【図８】



【図５】


START
A
601
全面枠201、
中央枠202の
輝度積分データ
読み出し
602
測光値(Y)計算
603
分割測光枠301の
輝度積分データ
読み出し
604
分割測光枠301の
平均データ１(a1)、
平均データ２(a2)、
平均データ３(a3)演算
605
(a2-a1)>(a1-a3)?
No
Yes
606
(a2-a1)>z ?
No
Yes
607
Yr=r-((a2-a1)*(b/c))
608
Yr=r
609
(a1-a3)>z ?
No
Yes
610
Yr=r+((a1-a3)*(b/c))
611
Y = Yr ?
(適正露出?)
No
Yes
A
B
B
612
Y<Yr ?
(露出アンダー?)
No
Yes
613
露出を明るく制御
614
露出を暗く制御
A

【公報種別】特許法第１７条の２の規定による補正の掲載
【部門区分】第７部門第３区分
【発行日】平成１３年１２月２１日（２００１．１２．２１）

【公開番号】特開２００１－１３６４３３（Ｐ２００１－１３６４３３Ａ）
【公開日】平成１３年５月１８日（２００１．５．１８）
【年通号数】公開特許公報１３－１３６５
【出願番号】特願平１１－３１４８６５
【国際特許分類第７版】
　Ｈ０４Ｎ　５/２３５
【ＦＩ】
　Ｈ０４Ｎ　５/２３５

【手続補正書】
【提出日】平成１３年３月２日（２００１．３．２）
【手続補正１】
【補正対象書類名】明細書
【補正対象項目名】特許請求の範囲
【補正方法】変更
【補正内容】
【特許請求の範囲】
【請求項１】　複数の分割測光枠と、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手段と、前記複数の分割測光枠のうち、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手段と、前記平均値ａ１と前記平均値ａ２を用いて、露光制御の適正目標値Ｙｒの補正を行う手段とを備えたことを特徴とする撮像装置。
【請求項２】　前記平均値ａ１と前記平均値ａ２との差分が、所定の閾値ｚを越えた場合、（ａ２－ａ１）の値に応じて、露出制御の適正目標値Ｙｒを下げる方向に補正を行うことを特徴とする請求項１に記載の撮像装置。
【請求項３】　前記（ａ２－ａ１）の値に応じて露出制御の適正目標値Ｙｒを下げる補正は以下の計算式、Ｙｒ　＝　ｒ　－　｛（ａ２－ａ１）　×　（ｂ／ｃ）｝　……（１）（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項２に記載の撮像装置。
【請求項４】　複数の分割測光枠と、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手段と、前記複数の分割測光枠のうち、輝度の低い順からサンプリングしたｙ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手段と、前記平均値ａ１と前記平均値ａ３を用いて、露光制御の適正目標値Ｙｒの補正を行う手段とを備えたことを特徴とする撮像装置。
【請求項５】　前記平均値ａ１と前記平均値ａ３との差分が、所定の閾値ｚを越えた場合、（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる方向に補正を行うことを特徴とする請求項４に記載の撮像装置。
【請求項６】　前記（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、Ｙｒ　＝　ｒ　＋　｛（ａ１－ａ３）　×　（ｂ／ｃ）｝　……（３）（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項５に記載の撮像装置。
【請求項７】　複数の分割測光枠と、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手段と、前記複数の分割測光枠のうち、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手段と、前記複数の分割測光枠のうち、輝度の低い順からサンプリングしたｙ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手段と、前記平均値ａ１、前記平均値ａ２、並びに前記平均値ａ３を用いて、露光制御の適正目標値Ｙｒの補正を行う手段とを備えたことを特徴とする撮像装置。
【請求項８】　前記平均値ａ１と前記平均値ａ２との差分、または前記平均値ａ１と前記平均値ａ３との差分のどちらか大きい方が、所定の閾値ｚを越えた場合、（ａ２－ａ１）または（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上下方向に補正することを特徴とする請求項７に記載の撮像装置。
【請求項９】　前記（ａ２－ａ１）の値が前記（ａ１－ａ３）の値より大きく、且つ前記（ａ２－ａ１）の値が所定の閾値ｚを越えた場合、前記（ａ２－ａ１）の値に応じて露出制御の適正目標値Ｙｒを下げる補正は以下の計算式、Ｙｒ　＝　ｒ　－　｛（ａ２－ａ１）　×　（ｂ／ｃ）｝　……（２）（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項８に記載の撮像装置。
【請求項１０】　前記（ａ２－ａ１）の値が前記（ａ１－ａ３）の値より小さく、且つ前記（ａ１－ａ３）の値が所定の閾値ｚを越えた場合、前記（ａ１－ａ３）の値

に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、Ｙｒ　＝　ｒ　＋　｛（ａ１－ａ３）×（ｂ／ｃ）｝……（３）（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項８に記載の撮像装置。

【請求項１１】　複数の分割測光枠を有した撮像装置の撮像方法であって、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手順と、前記複数の分割測光枠のうち、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手順と、前記平均値ａ１と前記平均値ａ２を用いて、露光制御の適正目標値Ｙｒの補正を行う手順とを含むことを特徴とする撮像方法。

【請求項１２】　前記平均値ａ１と前記平均値ａ２との差分が、所定の閾値ｚを越えた場合、（ａ２－ａ１）の値に応じて、露出制御の適正目標値Ｙｒを下げる方向に補正を行うことを特徴とする請求項１１に記載の撮像方法。

【請求項１３】　前記（ａ２－ａ１）の値に応じて露出制御の適正目標値Ｙｒを下げる補正は以下の計算式、Ｙｒ　＝　ｒ　－　｛（ａ２－ａ１）×（ｂ／ｃ）｝……（１）（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項１２に記載の撮像方法。

【請求項１４】　複数の分割測光枠を有した撮像装置の撮像方法であって、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手順と、前記複数の分割測光枠のうち、輝度の低い順からサンプリングしたｙ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手順と、前記平均値ａ１と前記平均値ａ３を用いて、露光制御の適正目標値Ｙｒの補正を行う手順とを含むことを特徴とする撮像方法。

【請求項１５】　前記平均値ａ１と前記平均値ａ３との差分が、所定の閾値ｚを越えた場合、（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる方向に補正を行うことを特徴とする請求項１４に記載の撮像方法。

【請求項１６】　前記（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、Ｙｒ　＝　ｒ　＋　｛（ａ１－ａ３）×（ｂ／ｃ）｝……（３）（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項１５に記載の撮像方法。

【請求項１７】　複数の分割測光枠を有した撮像装置の撮像方法であって、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手順と、前記複数の分割測光枠のうち、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手順と、前記複数の分割測光枠のうち、輝度の低い順からサンプリングしたｙ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手順と、前記平均値ａ１、前記平均値ａ２、並びに前記平均値ａ３を用いて、露光制御の適正目標値Ｙｒの補正を行う手順とを含むことを特徴とする撮像方法。

【請求項１８】　前記平均値ａ１と前記平均値ａ２との差分、または前記平均値ａ１と前記平均値ａ３との差分のどちらか大きい方が、所定の閾値ｚを越えた場合、（ａ２－ａ１）または（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上下方向に補正することを特徴とする請求項１７に記載の撮像方法。

【請求項１９】　前記（ａ２－ａ１）の値が前記（ａ１－ａ３）の値より大きく、且つ前記（ａ２－ａ１）の値が所定の閾値ｚを越えた場合、前記（ａ２－ａ１）の値に応じて露出制御の適正目標値Ｙｒを下げる補正は以下の計算式、Ｙｒ　＝　ｒ　－　｛（ａ２－ａ１）×（ｂ／ｃ）｝……（２）（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項１８に記載の撮像方法。

【請求項２０】　前記（ａ２－ａ１）の値が前記（ａ１－ａ３）の値より小さく、且つ前記（ａ１－ａ３）の値が所定の閾値ｚを越えた場合、前記（ａ１－ａ３）の値に応じて露出制御の適正目標値Ｙｒを上げる補正は以下の計算式、Ｙｒ　＝　ｒ　＋　｛（ａ１－ａ３）×（ｂ／ｃ）｝……（３）（ｂ及びｃは補正係数、ｒは閾値ｚに基づいて設定された既定値）に基づいて行われることを特徴とする請求項１８に記載の撮像方法。

【請求項２１】　コンピュータを前記請求項１乃至１０のいずれか１に記載の撮像装置に含まれる各手段として機能させるためのプログラムを記憶したコンピュータ読み取り可能な記録媒体。

【請求項２２】　コンピュータに前記請求項１１乃至２０のいずれか１に記載の撮像方法に含まれる各手順を実行させるためのプログラムを記憶したコンピュータ読み取り可能な記録媒体。

【手続補正２】
【補正対象書類名】明細書
【補正対象項目名】０００８
【補正方法】変更
【補正内容】
【０００８】
【課題を解決するための手段】上記目的と達成するため、本発明である請求項１に記載の撮像装置は、複数の分割測光枠と、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手段と、前記複数の分割測光枠のうち、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出す

る手段と、前記平均値ａ１と前記平均値ａ２を用いて、露光制御の適正目標値Ｙｒの補正を行う手段とを備えたことを特徴とする。

【手続補正３】
【補正対象書類名】明細書
【補正対象項目名】００１１
【補正方法】変更
【補正内容】
【００１１】また、本発明である請求項４に記載の撮像装置は、複数の分割測光枠と、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手段と、前記複数の分割測光枠のうち、輝度の低い順からサンプリングしたｙ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手段と、前記平均値ａ１と前記平均値ａ２を用いて、露光制御の適正目標値Ｙｒの補正を行う手段とを備えたことを特徴とする。

【手続補正４】
【補正対象書類名】明細書
【補正対象項目名】００１４
【補正方法】変更
【補正内容】
【００１４】また、本発明である請求項７に記載の撮像装置は、複数の分割測光枠と、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手段と、前記複数の分割測光枠のうち、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手段と、前記複数の分割測光枠のうち、輝度の低い順からサンプリングしたｙ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手段と、前記平均値ａ１、前記平均値ａ２、並びに前記平均値ａ３を用いて、露光制御の適正目標値Ｙｒの補正を行う手段とを備えたことを特徴とする。

【手続補正５】
【補正対象書類名】明細書
【補正対象項目名】００１８
【補正方法】変更
【補正内容】
【００１８】また、本発明である請求項１１に記載の撮像方法は、複数の分割測光枠を有した撮像装置の撮像方法であって、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手順と、前記複数の分割測光枠のうち、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手順と、前記平均値ａ１と前記平均値ａ２を用いて、露光制御の適正目標値Ｙｒの補正を行う手順とを含むことを特徴とする。

【手続補正６】
【補正対象書類名】明細書
【補正対象項目名】００２１
【補正方法】変更
【補正内容】
【００２１】また、本発明である請求項１４に記載の撮像方法は、複数の分割測光枠を有した撮像装置の撮像方法であって、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手順と、前記複数の分割測光枠のうち、輝度の低い順からサンプリングしたｙ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手順と、前記平均値ａ１と前記平均値ａ３を用いて、露光制御の適正目標値Ｙｒの補正を行う手順とを含むことを特徴とする。

【手続補正７】
【補正対象書類名】明細書
【補正対象項目名】００２４
【補正方法】変更
【補正内容】
【００２４】また、本発明である請求項１７に記載の撮像方法は、複数の分割測光枠を有した撮像装置の撮像方法であって、前記複数の分割測光枠の内のＰ個（Ｐは３以上の整数）の分割測光枠の測光輝度積分データの平均値ａ１を算出する手順と、前記複数の分割測光枠のうち、輝度の高い順からサンプリングしたｘ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ２を算出する手順と、前記複数の分割測光枠のうち、輝度の低い順からサンプリングしたｙ個（但し、１＜ｘ＜Ｐ）の測光輝度積分データの平均値ａ３を算出する手順と、前記平均値ａ１、前記平均値ａ２、並びに前記平均値ａ３を用いて、露光制御の適正目標値Ｙｒの補正を行う手順とを含むことを特徴とする。